FINAL

Work Plan for Voluntary Action Program Ineligible Sites at Air Force Plant 85, Columbus, Ohio

PREPARED BY:

EARTH TECH, INC.
1420 KING STREET, SUITE 600
ALEXANDRIA, VIRGINIA 22314

NOVEMBER 11, 1998

PREPARED FOR:

UNITED STATES AIR FORCE
AERONAUTICAL SYSTEMS CENTER
ACQUISITION ENVIRONMENTAL MANAGEMENT (ASC/EM)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

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DEPARTMENT OF THE AIR FORCE

HEADQUARTERS AIR FORCE MATERIEL COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

18 November 1998

MEMORANDUM FOR MR. DAN TJOELKER
SITE COORDINATOR
DIVISION OF EMERGENCY & REMEDIAL RESPONSE
CENTRAL DISTRICT OFFICE
3232 ALUM CREEK DR.
COLUMBUS OH 43207

FROM: ASC/EM(D)
1801 10TH ST STE 2
WRIGHT-PATTERSON AFB OH 45433-7626

SUBJECT: Final Work Plan for Ineligible Voluntary Action Sites at Air Force Plant 85

1. Please find the Final Work Plan for the Voluntary Action Program Ineligible Sites at Air Force Plant 85, Columbus, OH, enclosed for your review. The tentative schedule is to implement the Work Plan in April or May of 1999.

2. If you have any questions, please give me a call at 937-255-0359, extension 438.

Thomas R. Irvine

THOMAS R. IRVINE, LT, USAF
Environmental Compliance Project Manager
Acquisition Environmental Management

Attachment:
Ineligible Sites Work Plan

cc:
USEPA Region V (N. Gowda)
4300 E. 5th Ave. LLC (I. Chavez)
GSA (D. Spearman) w/o Attachment

1420 King Street, Suite 600, Alexandria, Virginia 22314

Telephone
703.549.8728

Facsimile
703.549.9134

November 11, 1998

Lt. Thomas R. Irvine
Department of the Air Force
Acquisition Environmental Management
Building 8
1801 Tenth Street, Suite 2
Wright-Patterson AFB, OH 45433-7626

Reference: Final Work Plan, Schedule, and Cost Estimate
Sites Ineligible for the Voluntary Action Program at Air Force Plant 85
Contract No. F33601-96-DW019/5007

Dear Lt. Irvine:

Enclosed please find five copies of the Final Work Plan for Voluntary Action Program Ineligible Sites at Air Force Plant 85, provided under separate cover. The Work Plan is provided as required in Sections 7.2 and 7.5.1 of the above referenced delivery order. The schedule for implementation of the Work Plan is included as page 6-2 in the document. Additionally, three copies of the revised Cost Estimate are enclosed. The estimate reflects the changes made as a result of actual costs incurred on the Phase II Property Assessment at Air Force Plant 85.

Earth Tech looks forward to implementing the work plan with ASC. If you have any questions or comments you would like to discuss, please feel free to contact me at (703) 549-8728, extension 555.

Very truly yours,

EARTH TECH, INC.

Judith M. Gallagher, P.E.
Senior Engineer

Enclosure

cc: ASC/PKWOEB (D. Dihrkop) w/o Encl
Project File

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1.0 Introduction

Air Force Plant 85 (AFP 85) is located in Franklin County, Ohio in the eastern portion of the City of Columbus. The facility is located at 4300 East Fifth Avenue, directly south of the Port Columbus International Airport and approximately 6 miles east-northeast of downtown Columbus. The location of the facility is shown on Figure 1-1.

AFP 85 is a Government-Owned, Contractor-Operated (GOCO) facility that was operated and maintained by two government contractors: Rockwell International and McDonnell Douglas. AFP 85 consists of two noncontiguous parcels which encompass approximately 420 acres: the main industrial manufacturing parcel consists of approximately 270 acres located north of East Fifth Avenue, and an undeveloped parcel consists of approximately 150 acres located west of Steltzer Road. Figure 1-2 shows the locations of parcels that constitute the AFP 85 real property.

The current boundary of AFP 85 real property consists of a number of parcels that the U.S. Government acquired between 1951 and 1986. The Navy transferred this land to the U.S. Air Force (USAF) in 1982. The Navy's complex at one time occupied approximately 515 acres of land either owned by the Navy or leased from the City of Columbus.

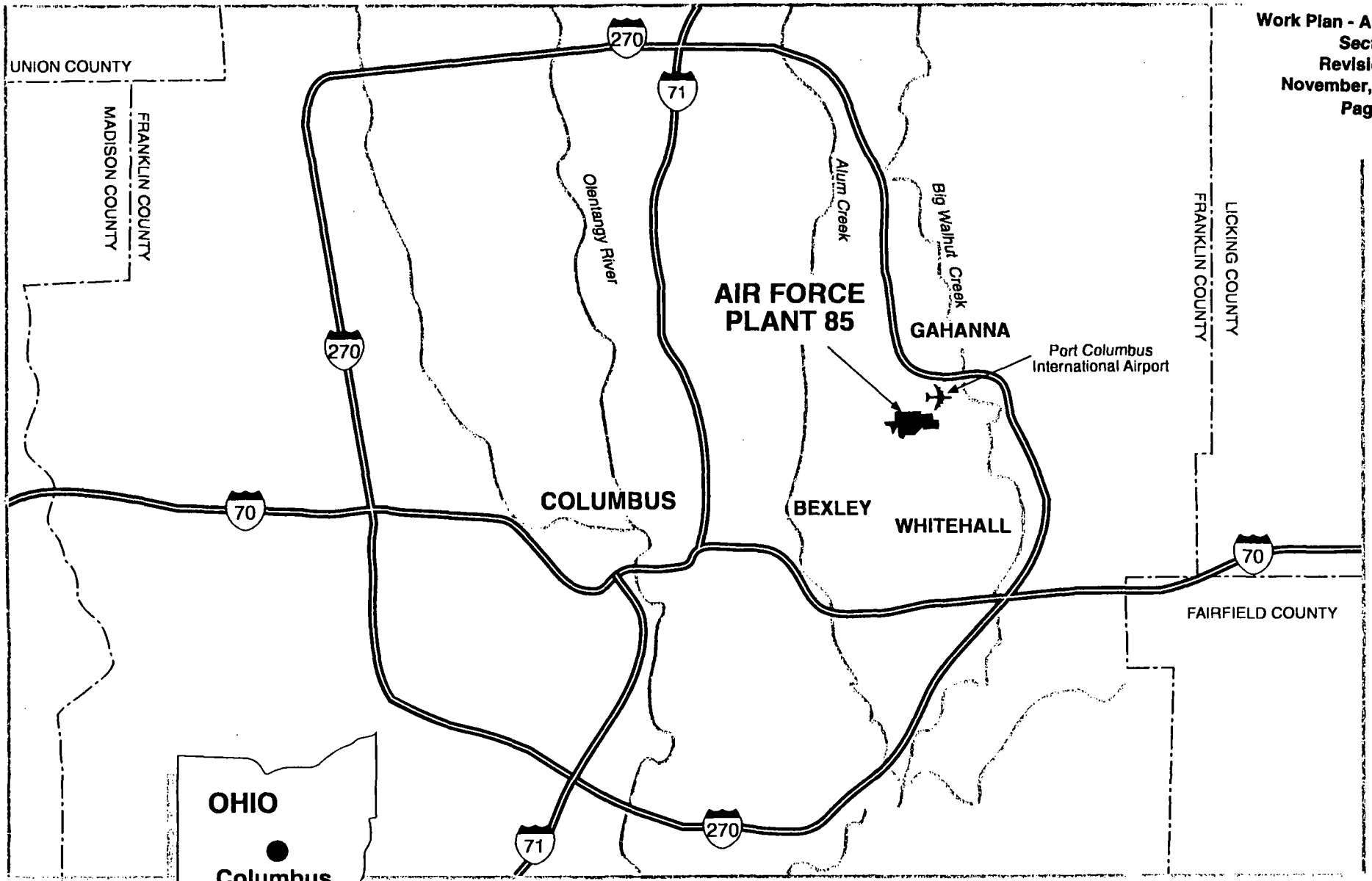
AFP 85 includes 420 acres of USAF-owned property, of which 55.82 acres is perpetual easement to the City of Columbus. The U.S. Department of Transportation (DOT), Federal Aviation Administration (FAA) has a use agreement with the City of Columbus dated 20 September 1975 for use of this easement. In addition, 21 acres of AFP 85 is easement to the State of Ohio, DOT.

1.1 Purpose of the Work Plan

This Work Plan was prepared for the USAF under Contract F33601-96-D-W019, Delivery Order 5007. The objectives of this Work Plan are: (1) to identify the requirements necessary to achieve No Further Action status at AFP 85 underground storage tank (UST) sites under the Ohio Bureau of Underground Storage Tank Regulations (BUSTR) and the Ohio Environmental Protection Agency (OEPA), and (2) to identify the requirements necessary to achieve closure at AFP 85 polychlorinated biphenyl (PCB) sites under the federal Toxic Substances Control Act (TSCA) regulations.

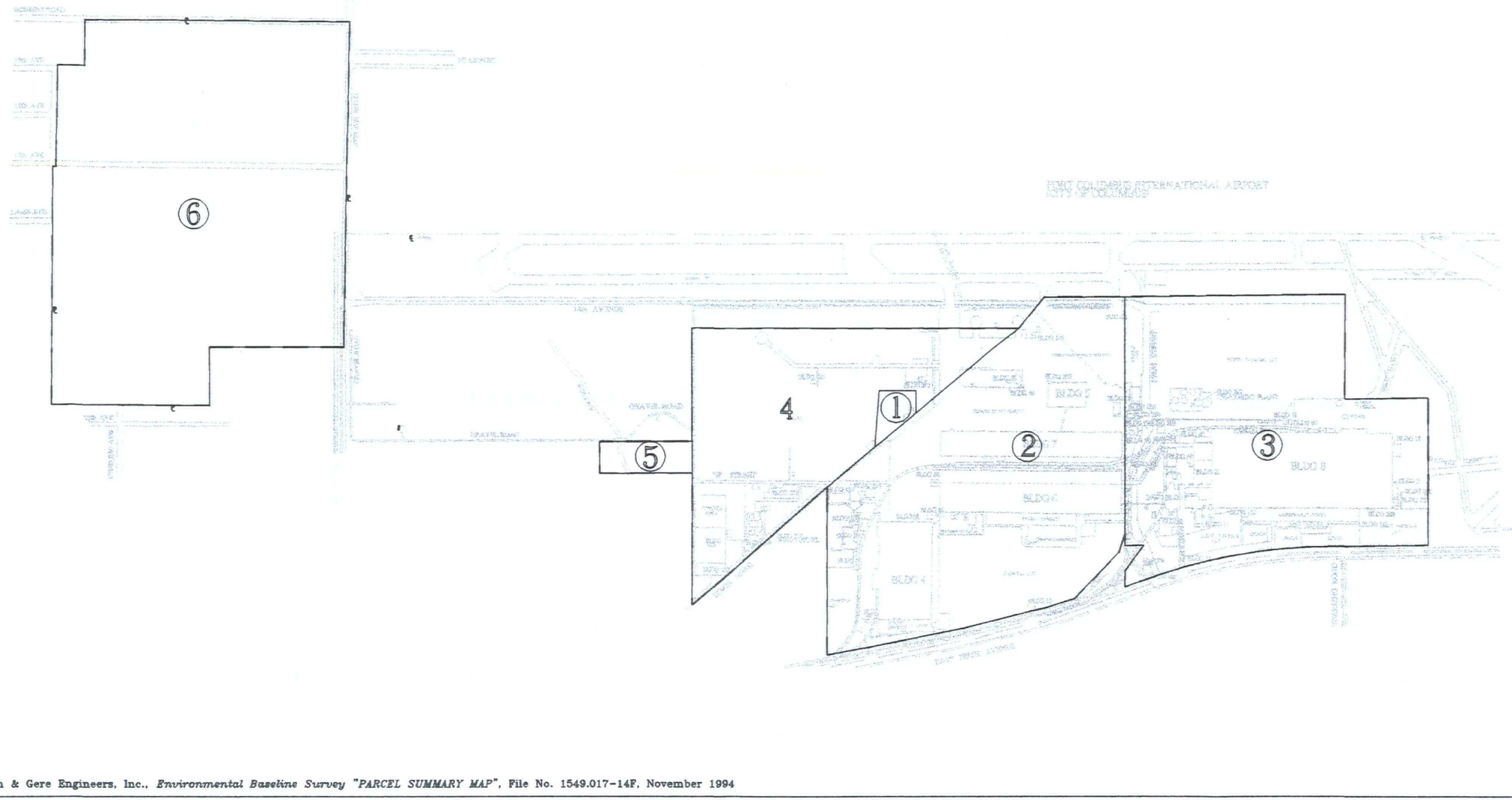
This Work Plan addresses sites at AFP 85 determined to be ineligible for inclusion in the Ohio Voluntary Action Program (VAP), Ohio's Brownfields initiative aimed at redevelopment of former industrial sites. The sites are ineligible for inclusion in the VAP because they are required to be investigated and/or remediated under other regulatory frameworks (i.e., BUSTR, OEPA, and TSCA). The sites were determined to be ineligible during a Phase I Property Assessment under the VAP (Reference 267).

In general, this Work Plan (1) provides a summary of the Phase I Property Assessment findings, (2) provides a summary of historical data pertaining to VAP-ineligible sites that was identified by the records search for this Work Plan, (3) provides a description of the data collection activities planned to be conducted, and (4) provides a general estimation of the time frame for completing the activities.



General Location of AFP 85

Figure 1-1



SOURCE: O'Brien & Gere Engineers, Inc., *Environmental Baseline Survey "PARCEL SUMMARY MAP"*, File No. 1549.017-14F, November 1994

F5.DWG/F14.PLT (XREF: XREF-3.DWG, F14.DWG)

12/97

PARCEL	CURRENT OWNER
1	UNITED STATES
2	UNITED STATES
3	UNITED STATES
4	UNITED STATES
5	UNITED STATES
6	UNITED STATES

— — — PLANT BOUNDARY

450 225 0 450 900 1350 1800

SCALE IN FEET

AIR FORCE PLANT 85
Columbus, Ohio
Parcel Summary Map

EARTH TECH

Figure 1-2

1.2 Prior Facility Operations

Construction of AFP 85 began in November 1940 with the building of Plant Number 3 by PLANCOR, the Defense Plant Corporation, a subsidiary of the Reconstruction Finance Corporation. The plant was constructed to produce naval aircraft during World War II and was operated by the Curtiss Wright Corporation (Curtiss-Wright). Aircraft produced at the plant included the SO3C Naval Scout Observation plane and the SB2C Naval fighter. A total of 800 SO3Cs were accepted for service and approximately 3,500 SB2Cs were produced at the plant. At the end of World War II, the SB2C-5 and the XBT2C experimental torpedo bomber were produced. Curtiss-Wright employed over 24,000 people at AFP 85 during World War II (Reference 52).

After World War II, three experimental aircraft models, the XBT2C, XSC-2, and XP-87, were produced at the plant. After 1946, C-46 and B-29 aircraft were overhauled under contract. In November 1950, due to the substantial decline in aircraft production, Curtiss-Wright discontinued operations at the plant (Reference 52).

In 1950, the U.S. Navy took title of Building 3, the original Plant Number 3, from PLANCOR. The plant became the Naval Industrial Reserve Aircraft Plant (NIRAP). Buildings 6 and 7, then referred to as Buildings 3A and 3B, were leased to the Lustron Corporation, a manufacturer of pre-fabricated houses. Lustron later declared bankruptcy, and these buildings were requisitioned by the Navy and incorporated into the NIRAP in April 1951 (Reference 52).

North American Aviation (North American) began producing aircraft at the NIRAP in November 1950. Aircraft produced included the F-86 Sabre Jets, T-66 Texan Trainers, AJ-2 Navy Bombers, and FJ Series Fury Jets. In addition, North American obtained the B-29 contract from Curtiss-Wright. Production began on the F100 Super Sabers in 1955 and T-28 Trojans in 1956. In 1956, North American also began the development of the T-25 Buckeye and the A3-J Vigilante. A missile project group was also established at the NIRAP in 1956 (Reference 52).

During the 1960s, North American continued to produce Naval aircraft such as the T-2, T-2B, T-2C, A-5, RA-5C, XAT-28E, and OV-10A. The missile division was involved in the development of the Redhead/Roadrunner for the Army, the Hornet for the USAF, and the Condor for the Navy. The thermodynamics laboratory (Building 271) and the transonic-supersonic wind tunnel (Building 210) were constructed during this decade (Reference 52).

North American continued aircraft production during the 1970s, but at a substantially lower rate. Ongoing development programs included the Condor missile, the YOD-10D, the B-1 Bomber, the Navy V/STOL (XFV-12A), the Army Hellfire, and the USAF GBU-15. Production in the early and mid-70s included the RA-5C, the B-1B Bomber, the Space Shuttle, the OV-10 and the T-2K (Reference 52).

In 1973, North American became Rockwell International. Due to the cancellation of several military programs at the end of the 1970s, AFP 85 operations only included the Army Hellfire missile and limited production work supporting military and commercial contracts. By 1979, Rockwell employed only 2,000 workers at AFP 85 (Reference 52).

Aircraft production during the 1980s included components for the B1-B Bomber aircraft, the MX-Peacekeeper Missile, and the Space Shuttle. In 1982, the Navy transferred the NIRAP to

the USAF. At that time the plant was designated as AFP 85. In 1988, McDonnell Douglas took over operation of AFP 85 from Rockwell. Operations at the facility included the production of parts for the F-15 and C-17 aircraft. Production ceased in early 1994, and McDonnell Douglas had completely vacated the plant by January 1995 (References 68, 154).

1.3 Environmental Baseline Survey (EBS) and EBS Addendum

An EBS was prepared in 1997 to document current environmental conditions at AFP 85 (Reference 213). The EBS, a standardized USAF environmental investigation, was based on information obtained through a series of records searches, interviews, and visual surveys. The records searches included a review of all available USAF, contractor, and regulatory agency records, including environmental restoration and compliance reports, audits, surveys, and inspection reports; an analysis of aerial photographs; and a review of recorded chain-of-property title documents. Interviews with former and current employees and visual surveys of the plant property and facilities were conducted. The EBS also included an assessment and description of properties contiguous to and within a 0.25-mile radius of the plant that could pose an environmental concern and/or affect the subject property. Physical inspections of adjacent properties were conducted; access was obtained from the owner or operator.

Thirty adjacent properties were visually inspected and evaluated in the adjacent property land use analysis. None of the properties identified are known to have been contaminated as a result of AFP 85 activities. The potential exists for migration of contaminants from several adjacent properties to AFP 85 property; however, there is no evidence that adjacent properties are a source of contamination migrating onto the plant.

An addendum to the EBS was prepared to fulfill the requirements of the Ohio VAP for a Phase I Property Assessment (Reference 267). The addendum categorized AFP 85 areas based on the USAF's seven property category definitions as follows:

- **Category 1**: Areas where no storage, release, or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas).

- **Category 2**: Areas where storage of hazardous substances or petroleum products has occurred, but in which no release, disposal, or migration from adjacent areas has occurred.

- **Category 3**: Areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, but at concentrations that do not require a removal or remedial action.

- **Category 4**: Areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, and all remedial actions necessary to protect human health and the environment have been taken.

- **Category 5**: Areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, removal and/or remedial actions are under way, but all required remedial actions have not yet been completed.

- **Category 6**: Areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, but required response actions have not yet been implemented.

- **Category 7**: Areas that are unevaluated or require additional evaluation.

Category 1 properties may include areas such as paved roadways and parking lots where *de minimis* (as defined by OAC 3745-300-06 (G)) amounts of oil may have been released from vehicles over time under normal conditions. Other types of Category 1 properties include manicured lawns and other groomed areas that may have received licensed application of pesticides. Category 2 properties are defined as hazardous substance or petroleum product storage areas where there is no evidence of a release. No Category 3 properties have been identified at AFP 85.

Category 4 through 7 properties were evaluated in the EBS Addendum. Category 4 through 6 properties are areas where a release requiring a removal or remedial action has occurred. The current status of remedial action in that area determines the category. Category 4 indicates that all remedial actions necessary to protect human health and the environment had been completed at the time of the EBS Addendum. For example, a site having a risk-based closure with State and Federal concurrence would be designated as Category 4. If remedial actions were initiated in an area with known contamination, but were not completed at the time of the EBS Addendum, then Category 5 was assigned to that area. Category 6 applies to areas with known contamination, but where required remedial actions were not initiated at the time of the EBS Addendum. No Category 6 properties have been identified at AFP 85.

Category 7 properties include areas that were undergoing investigation at the time of the EBS Addendum or areas of potential environmental concern that have not been evaluated. For example, Category 7 applies if contamination is suspected in a building or area where no assessment has been conducted to evaluate that building or area.

To satisfy the requirements for a Phase II Property Assessment, Category 5 and 7 properties were divided into Ohio VAP-eligible and ineligible properties. Category 5 and 7 properties that are eligible for participation in the Ohio VAP are shown in Figure 1-3 and are referred to by a unique identifier called the FACNO (i.e., Facility Number) that was assigned to AFP 85 sites by the EBS (Reference 213) and the EBS Addendum (Reference 267). These properties either were previously closed or are not subject to closure under existing regulatory programs. A Phase II SOW to investigate these sites under the VAP has been prepared (Reference 308). Implementation of the Phase II SOW is scheduled to begin in July 1998.

Category 5 and 7 properties that are ineligible for participation in the Ohio VAP are shown in Figure 1-4. These sites are either former UST locations or PCB-contaminated sites that require further investigation in accordance with BUSTR/OEPA or TSCA regulations, respectively. This Work Plan describes the work to be performed at each of these sites to meet these requirements. Once no further action or clean closure is granted by BUSTR/OEPA and TSCA, respectively, it is anticipated that the sites will become eligible for the VAP. For this reason, samples collected pursuant to this Work Plan will be analyzed at VAP-certified laboratories such that the analytical results can be used, as necessary, once these sites become eligible for the VAP.

IRP-5
270
270-289
FIRINGRANG
7-290
13-WRACK
282-282A
13
282-282C
282-282B
PSEWER
3-PLENUM
3-VAPDEG
IRP-7
3-102
3-105
3-ALCLEAN
3-HTA
3-PLATING
3-CHEMFILM
3-ANODIZE
3-DPSHOP
3-SMPFAB3
3-SMPFAB4
SSEWER
STORMSYS
IRP-2
6-SMAREA
9-91
3-HCOMBND2
3-AUTOCPIT
3-ALBENDCL
SSEWER
SSEWER
IRP-5
9-BATST
8-93
8-94
8-95
8-116
8-115
SSEWER
IRP-6
IRP-1
IRP-10
SPTANK3
SPTANK4
IRP-4
271-279
271-ACVPIT
SPTANK5
125-FBA-3
125-BAILER
125-SUMP
SPTANK2
SPTANK1
4-BATYCHRG

Plant Boundary

Category 5 VAP Eligible Site

Category 7 VAP Eligible Site

0 200 400 800

Scale in Feet

EARTH TECH

Figure 1-3

Category 5 and 7
VAP Eligible Sites
AFP 85

85_5-7.DWG/1-3.PLT

141-297
141-109
141-110
141-215
141-111
5-159
5-160
49-90
7-257
7-TV18
7-TV17
10-545
10-546
404-96
10-287
3-98
3-99
3-101
IRP-9
3-103
3-104
3-107
3-106
10-146
10-147
271-MS2
124-274
124-161
124-162
124-164
124-163
124-165
214-240
214-239
21-97
125-SUB27
125-168
9-92
11-SUB11A
11-MS1
3-SUB34
4-FBA-1
4-FBA-2

N

Plant Boundary

Category 5 VAP Ineligible Site

Category 7 VAP Ineligible Site

0 175 350 700

Scale in Feet

EARTH TECH | Figure 1-4

Category 5 and 7
VAP Ineligible Sites
AFP 85

VAP13.DWG/1-4.PLT

Several sites identified as ineligible in the EBS Addendum and the Phase II SOW (Refs. 267, 308) have since been remediated and closed under the appropriate regulatory program. These sites include IRP Site 3 (PCB spill site) and Transformer Vault 72. A description of work performed at these sites is included in Section 3.

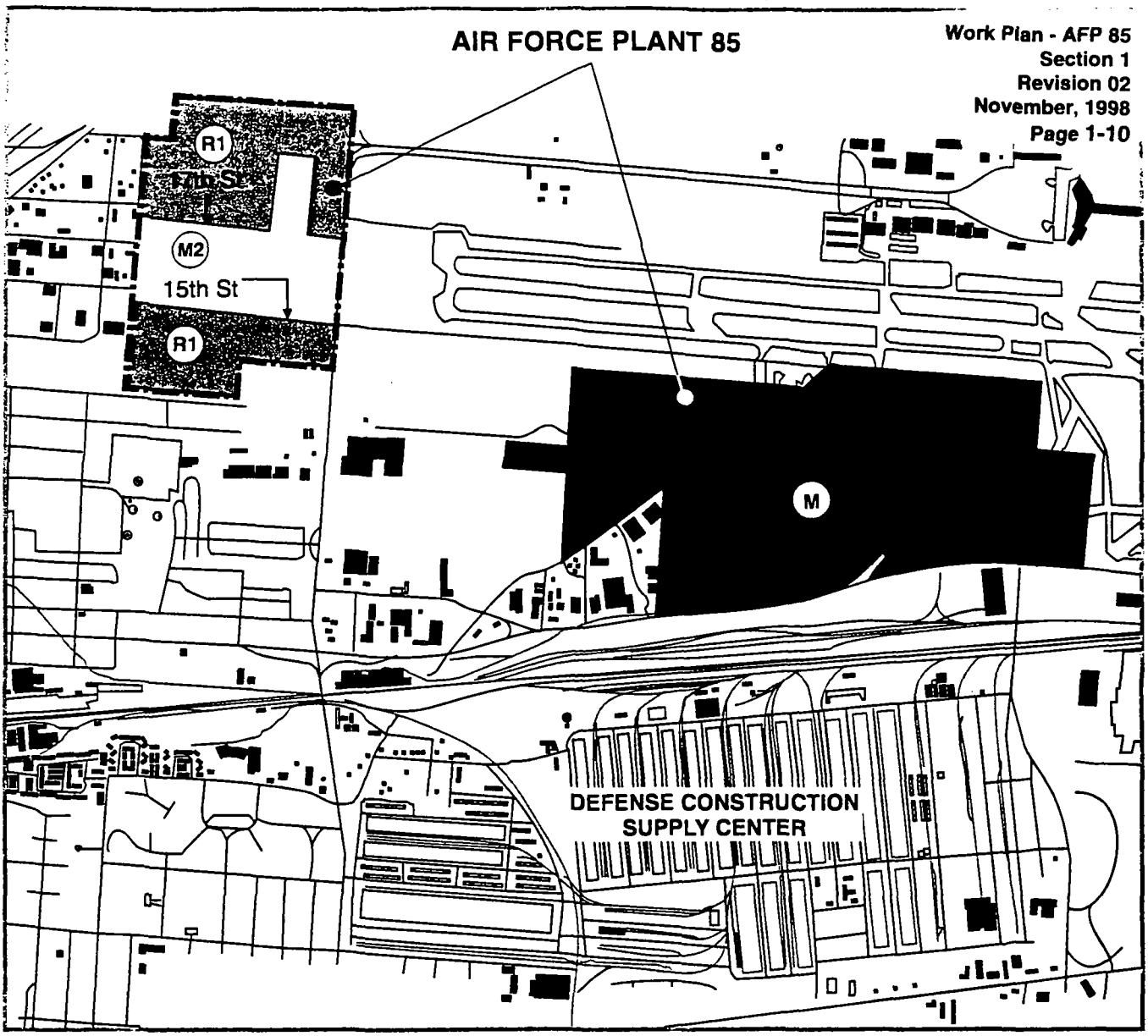
1.4 Current and Intended Uses of AFP 85

All production activities at the plant ended in March 1994. Since then, the Defense Finance Accounting Service (DFAS) has occupied office space in Buildings 3, 4, and 6.

The USAF plans to divest AFP 85 through two separate transfers. The portion of the property contiguous with the Port Columbus International Airport (the northern portion of the main industrial parcel) is intended to be transferred to the Columbus Port Authority for airport use. The undeveloped parcel located west of Stelzer Road, is currently zoned as a manufacturing (M) and residential (R1) district, and will also be transferred to the Port Authority. These two parcels will be transferred in the same deed on which the USAF plans to place restrictions for industrial uses only. Figure 1-5 shows the zoning at AFP 85.

The remainder of the main parcel, which contains the majority of the structures, has been transferred to 4300 East Fifth Avenue LLC. The main parcel is currently zoned by the City of Columbus as a manufacturing district. According to the current zoning maps, uses can include general industrial and commercial activities. However, as part of the property transfer, the USAF placed restrictions on the deed for industrial uses only.

Environmental restoration is ongoing on the main parcel of AFP 85.



Source: Ref 252

Zoning at AFP 85,
Columbus, Ohio

- M — General Industrial and Commercial
- M2 — Limited Industrial and Office Only
- R1 — Residential, Single Family
- AFP 85 Boundary

-N-

0 550 1100 2200

Scale in Feet

Figure 1-5

2.0 Regulatory Requirements for Closure of VAP-Ineligible Sites

All sites included in this Work Plan are considered ineligible for the Ohio VAP. UST sites are subject to the requirements of BUSTR and OEPA. PCB sites are subject to the requirements of the United States Environmental Protection Agency (USEPA) PCB Spill Cleanup Policy. Once sites require no further action under these regulatory programs, they may become eligible for the VAP. The following subsections present the requirements of BUSTR, OEPA, and the USEPA PCB Spill Cleanup Policy as applicable to the VAP-ineligible sites at AFP 85.

2.1 Bureau of Underground Storage Tank Regulations

Release reporting and corrective action requirements for USTs which store or stored petroleum products, regulated by BUSTR, are prescribed by OAC 1301:7-9-13. This rule is adopted by the Ohio State Fire Marshal in accordance with Chapter 119 of the Revised Code, but is not considered part of the "Ohio State Fire Code". The following is an overview of this rule, with emphasis on sections relevant to performing a site check for VAP-ineligible USTs that are being addressed by this Work Plan; this subsection should not be considered a complete detailed presentation of OAC 1301:7-9-13.

In accordance with OAC 1301:7-9-13 (D), confirmation of suspected releases from a UST site requires the following: (1) a tightness test, if the UST has not been removed; (2) an analysis of drinking-water well(s) suspected of being impacted; and (3) a site check. A UST site is defined by OAC 1301:7-9-13 as the parcel of property where a UST system is or has been located.

Upon completion of the site check at UST systems which stored petroleum substances, a site assessment is required if: (1) free product was present during the site check; (2) soil or groundwater analytical results exceed the appropriate action levels for the UST site established by the Site Feature Scoring System (SFSS) prescribed by OAC 1301:7-9-13(E); or (3) the Ohio State Fire Marshal determines a site assessment is necessary. The SFSS is described in subsection 2.1.3.

A site assessment defines the vertical and horizontal extent of soil and groundwater contamination (to background or nondetectable levels) in the area surrounding the UST site. A site assessment report must be submitted to the Ohio State Fire Marshal for approval. After approval of the site assessment report, if any soil and/or groundwater contamination exceeds Maximum Contaminant Levels (MCLs), Recommended MCLs (RMCLs), or appropriate soil action levels established by the SFSS, a remedial action plan (RAP) must be developed and submitted to the Ohio State Fire Marshal.

A RAP must be developed to remediate any soil and/or groundwater contamination above established MCLs, RMCLs, or appropriate soil action levels established by the SFSS. RAPs for sites with both soil and groundwater contamination must incorporate soil cleanup levels that ensure soil contamination is not a continuing threat to groundwater, and ensure that groundwater remediation is possible that will reduce contaminant concentrations to MCLs or other risk-based standards. Upon approval of the RAP by the Ohio State Fire Marshal, the

RAP will be implemented and progress reports will be submitted to the Ohio State Fire Marshal. When the remedial objectives of the RAP have been achieved, a RAP completion report is submitted to the Ohio State Fire Marshal for approval to terminate the remedial program and to provide a formal description of No Further Action status.

2.1.1 Site Check Procedure

As stated above, OAC 1301:7-9-13(D) contains three requirements for UST sites: a tightness test, sampling and analysis of drinking water wells, and a site check. At AFP 85, all VAP-ineligible USTs that are addressed by this Work Plan were either removed, or abandoned and filled with concrete, prior to December 22, 1988. As a consequence, a tightness test is not applicable. An inventory of well logs in the AFP 85 vicinity conducted at the Ohio Department of Natural Resources (ODNR) in November 1997 showed no operating production/drinking wells within 0.5 miles of the AFP 85 boundary.

According to OAC 1301:7-9-13(D)(3), a site check must be performed to confirm a suspected release and to determine whether subsurface soil and/or groundwater at the UST site are contaminated with petroleum products in excess of the action levels prescribed by OAC 1301:7-9-13(E). If free product is discovered during the site check, the site check should be discontinued, and free product removal and a site assessment are then required in accordance with OAC 1301:7-9-13(G) and (I), respectively.

According to OAC 1301:7-9-13, a site check requires a minimum of three soil borings at locations where contamination would most likely be present or would have migrated considering information known about the site and the suspected release. For the VAP-ineligible USTs that will be investigated by the site check methodology, a BUSTR representative suggested (Reference 322) that soil boring locations be based on soil sampling locations prescribed by OAC 1301:7-9-12(K)(4)(c) and (e) for the closure assessment of a UST system. Specifically,

- A soil boring will be installed under both ends of each former UST location. If a UST was longer than 35 feet, an additional soil boring will be installed under the middle of the former UST. For a permanently abandoned UST, soil borings will be installed as close to both ends of the abandoned UST as possible.
- A soil boring will be installed every 20 feet along piping runs that routinely contained regulated substances. If the piping run was less than 20 feet long, no soil boring is required.
- A soil boring will be installed underneath each dispensing unit. If the dispensing unit was located directly above the UST, no soil boring is required.
- A soil boring will be installed below any remote fill pipe area located more than 10 feet from the UST cavity excavation.

Each boring installed for the site check must be advanced either to twenty feet, to auger refusal, to the groundwater table, or to a groundwater confining layer, whichever is encountered first. Continuous samples are required at each boring, and soil samples will be field screened for organic vapors using a photoionization detector (PID) or flame ionization detector (FID). For each boring, the soil sample with the highest field screen reading will be submitted to a laboratory for analysis. If field screening of soil samples does not register a reading and groundwater has not been encountered, a soil sample from the bottom of the boring will be

submitted to a laboratory for analysis. If field screening of soil samples does not register a reading and if groundwater is encountered, a soil sample from immediately above the soil-groundwater interface will be submitted to a laboratory for analyses.

In addition to these soil samples, if groundwater is encountered at a boring, a sample of the groundwater must be obtained from the boring and submitted to a laboratory for analysis. If groundwater is encountered but a groundwater sample cannot be collected, a soil sample from immediately above the soil-groundwater interface will be sent to the laboratory for analysis.

Based on the type of product suspected of being released at the UST site, all samples collected during the site check will be analyzed for constituents prescribed for the product based on Table 1 of OAC 1301:7-9-13:(D); this table is provided in this document as Table 2-1. If more than one type of product is suspected of being released, all applicable analytical methods for those product types must be used. All field screening, soil and groundwater sampling procedures, and analytical methods, will be conducted in accordance with the procedures and methods established in the BUSTR Corrective Actions Guidance Document, Appendix A: Soil and Water Sampling Techniques (Reference 316).

UST systems that stored petroleum products are regulated by BUSTR. UST systems which stored hazardous substances are subject to the requirements of both BUSTR and OEPA. The same sampling methodology described above for the site check of petroleum UST systems will also be employed for the VAP-ineligible UST systems which stored hazardous substances. Based on guidance from BUSTR and OEPA, soil and groundwater samples will be analyzed based on the hazardous substance(s) stored at the UST site using laboratory-recommended analyses.

2.1.1.1 Evaluation of Soil and Groundwater Analytical Results and Reporting Requirements

If the UST system stored a regulated petroleum substance, the SFSS provided in OAC 1301:7-9-13 is used to establish appropriate action levels for the UST site. If laboratory-quantified soil or groundwater concentrations from samples collected during the site check are at or below the SFSS established action levels (discussed in subsection 2.1.1.2), further remediation may not be required by BUSTR. If laboratory-quantified soil or groundwater concentrations exceed the SFSS established action levels, additional corrective actions are necessary and the UST system must undergo a site assessment as defined by OAC 1301:7-9-13.

A site check report containing the analytical results, the SFSS scoring for the UST site, and all required documentation must been submitted to the Ohio State Fire Marshal as defined by OAC 1301:7-9-13 and the BUSTR Corrective Actions Guidance Document (Reference 316). Upon review of the report, the Ohio State Fire Marshal will determine if a site assessment is required at the UST site.

For UST systems which stored a regulated hazardous substance, the SFSS is not used. The site check report is sent to both BUSTR and OEPA. Although the Ohio State Fire Marshal has the authority to regulate the closure of an UST system that contained regulated substances (i.e., either a petroleum or hazardous substance), OEPA, not the Ohio State Fire Marshal, has the authority to require remedial actions when hazardous substances are released.

Table 2-1
Ohio State Fire Marshal Analytical Parameters and Methods

Analytical Group	Constituent	Analytical Method for Soil Samples	Analytical Method for Water Samples
1. Gasoline (motor gasoline, aviation gasoline, gasohol)	Benzene	USEPA Method 8020	USEPA Method 602
	Toluene	USEPA Method 8020	USEPA Method 602
	Ethyl benzene	USEPA Method 8020	USEPA Method 602
	Total xylenes	USEPA Method 8020	USEPA Method 602
	TPH	USEPA Method 8015 (Modified)	Not Applicable
2. Middle distillates (kerosene, diesel fuel, jet fuel and light oils)	Benzene	USEPA Method 8020	USEPA Method 602
	Toluene	USEPA Method 8020	USEPA Method 602
	Ethyl benzene	USEPA Method 8020	USEPA Method 602
	Total xylenes	USEPA Method 8020	USEPA Method 602
	PAH	USEPA Method 8100 (Modified)	USEPA Method 610
	TPH	USEPA Method 418.1	Not Applicable
3. Used oil and unknowns	VOA	USEPA Method 8240	USEPA Method 624
	TPH	USEPA Method 418.1	Not Applicable
4. Heavy fuel oils and lubricating oils	TPH	USEPA Method 418.1	Not Applicable
5. Other compounds	Not Applicable	Consult with the SFM	Consult with the SFM

Key: USEPA = Environmental Protection Agency
PAH = Polynuclear Aromatic Hydrocarbons
SFM = State Fire Marshall
TPH = Total Petroleum Hydrocarbons
VOA = Volatile Organic Aromatics

2.1.1.2 The Site Feature Scoring System

The SFSS is used to establish action levels for UST sites based on site-specific environmental characteristics. The SFSS is used when petroleum contaminants have been detected in soil and/or groundwater samples collected at the site during the site check. The SFSS is not used if a hazardous substance has been stored or released at the UST site. If laboratory-quantified soil and groundwater concentrations are at or below the SFSS-established action levels for the site, further remediation may not be required by the Ohio State Fire Marshal. If soil and/or groundwater concentrations exceed the SFSS-established action levels for the site, a site assessment is required in accordance with OAC 1301:7-9-13.

The SFSS requires site-specific information to complete the SFSS Chart and thereby score the UST site. The SFSS Chart is provided as Table 2-2. In general, the SFSS Chart requires the following information for completion:

- Site Feature 1: Distance of the UST site from a potable water supply, and determination if the UST site is located within a designated sensitive area as defined by OAC 1301:7-9-9.
- Site Feature 2: The depth to groundwater.
- Site Feature 3: The predominant soil type of the substratum.
- Site Feature 4: Natural and/or man-made conduits or receptors; this feature requires a separate scoring worksheet located below Table 2-2.

These site features have specific definitions and requirements to properly score the UST site. The type of information required to justify the score for each site feature is clarified in OAC 1301:7-9-13 (E) and in Appendix D of the BUSTR Closure Guidance Document (Reference 317).

For site features 1-3, the SFSS Chart column (A-D) that most accurately describes the site must be selected. The column score provided in the column heading should be written in the score column for the site feature. For site feature 4, a separate worksheet must be scored; the worksheet is provided with Table 2-2. After determining the total score from this worksheet, compare the total worksheet score with the scores in the SFSS chart for site feature 4 and select the appropriate column. Then, the column score provided in the column heading should be written in the score column for site feature 4.

Once site features 1-4 have been scored, the scores in each score column are added to obtain a subtotal for each score column. Then, the subtotal scores are added horizontally to obtain the total score for the site.

The total score for the UST site should be compared to the scores in the SFSS Action Level Table, provided as Table 2-3, to determine the appropriate Action Level Table category. This category lists the action levels of benzene, toluene, ethyl benzene, and xylenes (BTEX) for soil and groundwater, and total petroleum hydrocarbons (TPH) for soil, applicable for the UST site.

Table 2-2
Site Feature Scoring System (SFSS) Chart
Refer to SFSS Guidelines (pages 33-34) of Appendix D of the BUSTR Closure Guidance Document (Reference 317)

Site Features	Column A Score 20	Enter Score	Column B Score 15	Enter Score	Column C Score 10	Enter Score	Column D Score 5	Enter Score
1. Distance of UST system from closest potable water supply source currently in use is:	> 1,000 feet		300-1,000 feet		<300 feet		Inside of designated sensitive area	
2. Depth to groundwater is:	> 50 feet		31-50 feet		15-30 feet or unknown		< 15 feet	
3. Predominant soil type of substratum is:	Clay or shale		Silt or clayey sands or fine sandstone		Silty sand or fine sand, unknown, or sandstone		Clean sand, gravel, or conglomerate	
4. Natural and/or man-made *conduits or receptors are*: (complete Worksheet below)	< 8 points		8-10 points		11-13 points		>13 points	
Add subtotals:			+		+		+	
							Total Score	

Site Feature 4 Worksheet:

Basements or subsurface foundations within 100 feet of UST system	4 points	_____
Storm sewer within 50 feet of UST system	4 points	_____
Sanitary sewer within 50 feet of UST system	4 points	_____
Septic system leach field within 50 feet of UST system	2 points	_____
Water line main within 50 feet of UST system	1 point	_____
Natural gas line main within 50 feet of UST system	1 point	_____
Bedrock area prone to dissolution along joints of fractures within 100 feet of UST system	1 point	_____
Faults or known fractures within 100 feet of UST system	1 point	_____
Buried telephone/television cable main within 50 feet of UST system	1 point	_____
Buried electrical cable main within 50 feet of UST system	1 point	_____
Total Points		_____

If total points from Site Feature 4 Worksheet are:

<8, enter score of 20 in Column A of Site Feature 4 in SFSS Chart
8-10, enter score of 15 in Column B of Site Feature 4 in SFSS Chart
11-13, enter score of 10 in Column C of Site Feature 4 in SFSS Chart
>13, enter score of 5 in Column D of Site Feature 4 in SFSS Chart

Table 2-3
SFSS Action Levels

Constituent	Category 1	Category 2	Category 3	Category 4
Total Score	<31	31-50	51-70	>71
Constituents level in soil:				
Benzene	0.006 PPM	0.170 PPM	0.335 PPM	0.500 PPM
Toluene	4 PPM	7 PPM	9 PPM	12 PPM
Ethyl benzene	6 PPM	10 PPM	14 PPM	18 PPM
Total Xylenes	28 PPM	47 PPM	67 PPM	85 PPM
Constituents level in groundwater:				
Benzene	0.005 PPM	0.005 PPM	0.005 PPM	0.005 PPM
Toluene	1 PPM	1 PPM	1 PPM	1 PPM
Ethyl benzene	0.700 PPM	0.700 PPM	0.700 PPM	0.700 PPM
Total Xylenes	10 PPM	10 PPM	10 PPM	10 PPM
TPH level in soil:				
Analytical Group No. 1 (Gasoline)	105 PPM	300 PPM	450 PPM	600 PPM
Analytical Group Nos. 2, 3, and 4	380 PPM	642 PPM	904 PPM	1156 PPM

Key: PPM = Parts Per Million

The SFSS Chart, the Site Feature 4 Worksheet, and the SFSS Action Level Table, provided here in Tables 2-2 and 2-3, are defined in OAC 1301:7-9-13 (E).

2.2 PCB Regulations

This section provides an overview of the USEPA's PCB Spill Cleanup Policy (40 Code of Federal Regulations [CFR] 761 Subpart G) and discusses how this policy applies to PCB sites at AFP 85. This policy is part of the USEPA's Toxic Substance Control Act (TSCA) (40 CFR 700) which regulates cleanup of toxic substances (i.e., lead based paint, PCBs, asbestos).

2.2.1 USEPA's PCB Spill Cleanup Policy

On April 2, 1987, the USEPA issued a final rule establishing a National PCB Spill Cleanup Policy (40 CFR 761, Subpart G). The policy became effective May 4, 1987. Spills are defined as intentional or unintentional leaks, spills, and other uncontrolled discharges of any quantity of PCBs running off or about to run off the external surface of the equipment or PCB source, as well as the resulting contamination. The scope of the policy covers most new spills of PCB fluids containing at least 50 parts per million (ppm) or above.

The policy addresses five basic aspects of PCB spill response. Generally, for all new spills of materials containing more than 500 ppm PCB, the following is required:

1. Reporting: To the USEPA regional office and National Response Center (NRC) within 24 hours after the spill has been discovered.
2. Cleanup: Completion within 48 hours of spill discovery.
3. Performance Standards: Variable according to spill location and mass of PCBs spilled.
4. Post-Cleanup Sampling: Statistically valid methodology and analytical techniques for verification.
5. Recordkeeping: Certification and document retention for 5 years.

Existing spills (spills which occurred prior to May 4, 1987) are excluded from the scope of this policy. The policy is not intended to require additional cleanup where a party has already remediated a spill in accordance with requirements imposed by the USEPA through its regional offices. In addition, the USEPA recognizes that old spills discovered after the effective date of this policy will require site-by-site evaluation because of the likelihood that the site involves more pervasive PCB contamination than fresh spills, and that old spills are generally more difficult to clean up. Therefore, spills which occurred before May 4, 1987 will be decontaminated to requirements established at the discretion of the USEPA, usually through its regional offices.

The USEPA retains the flexibility to allow less stringent or alternative decontamination measures based upon site-specific considerations. Less stringent requirements may apply if the responsible party demonstrates that cleanup to the numerical decontamination levels is clearly unwarranted because of risk mitigating factors, that compliance with the procedural requirements or numerical standards in the policy is impracticable at a particular site, or that site-specific characteristics make the costs of cleanup prohibitive.

The USEPA retains the authority to require additional cleanup upon finding that the numerical decontamination levels in the policy have not been met. In addition, the USEPA also retains the authority to require more stringent numerical decontamination levels in situations where the Regional Administrator finds that further cleanup must occur to prevent unreasonable risk. For example, site-specific characteristics, such as short depth to groundwater, type of soil, or the presence of a shallow well, may pose exceptionally high potential for groundwater contamination by PCBs remaining after cleanup to the standards specified in the policy.

The policy excludes from application of final numerical cleanup standards certain spill situations: spills directly into surface waters, drinking water, sewers, grazing lands, and vegetable gardens. These types of spills are subject to final cleanup standards to be established at the discretion of the regional office. However, these spills are subject to immediate notification requirements and measures to minimize further environmental contamination. There are no sites in this category at AFP 85.

2.2.1.1 Release Response Actions and Cleanup Levels

Release response actions and cleanup levels differ depending on the mass of PCBs spilled and the nature of the spill. The USEPA has divided the spills into two types which are designated as Category I and Category II spills.

Category I Spills: Spills of PCB-contaminated material (concentrations of 50-500 ppm) containing less than 1 pound of pure PCB by weight, or spills of less than 270 gallons of untested mineral oil.

Category II Spills: Spills involving PCB materials containing concentrations greater than 500 ppm, spills of PCB-contaminated material (concentrations of 50-500 ppm) containing more than 1 pound of pure PCB by weight, or spills of more than 270 gallons of untested mineral oil.

Release response actions and cleanup levels associated with each category are discussed below.

Category I Spills:

- Solid Surfaces: Double wash/rinse with solvent.
- Soil: Remove visible traces plus a buffer of 1 lateral foot; the ground must be restored to its original configuration by backfilling with clean soil (i.e. containing less than 1 ppm PCBs).
- Documentation: Provide cleanup records and certification. The records and certification must be maintained for 5 years.

Category II Spills:

- Notification: Contact the USEPA regional office and NRC if more than 10 pounds of PCB by weight.
- Barrier Protection: Restrict access to spill area plus a 3 foot buffer zone.
- Eliminate Spillage: Stop flow with absorbent or plug.
- Initiate Cleanup: Remove visible traces of spill from solid surfaces and soil.

The following are cleanup standards required of spill cleanup. The USEPA has not placed a time limit on completion of the cleanup effort since the time required for completion will vary from case to case. However, the USEPA expects decontamination will be achieved promptly. Cleanup should be completed and should achieve the following specific standards for each listed location:

Outdoor Electrical Substations:

- Solid Surfaces (impervious and non-impervious): 100 micrograms per 100 square centimeters ($\mu g/100\ cm^2$) as measured by standard wipe tests.
- Soil: 25 or 50 ppm plus attached label or notice.

Other Restricted Access Areas:

- High-Contact, Outdoor Surfaces and Low-Contact, Indoor, Impervious Surfaces: 10 $\mu g/100\ cm^2$.
- Low-Contact, Indoor, Nonimpervious Surfaces: 10 $\mu g/100\ cm^2$ or 100 $\mu g/100\ cm^2$ plus encapsulation.
- Low-Contact, Outdoor Surfaces (impervious and non-impervious): 100 $\mu g/100\ cm^2$.
- Soil: 25 ppm.

Non-restricted Access Areas:

- High-Contact, Outdoor Surfaces and Indoor Solid Surfaces: 10 $\mu g/100\ cm^2$
- Indoor Vault Areas and Low-Contact, Outdoor, Impervious Solid Surfaces: 10 $\mu g/100\ cm^2$.
- Low-Contact, Outdoor, Nonimpervious Surfaces: 10 $\mu g/100\ cm^2$ or 100 $\mu g/100\ cm^2$ plus encapsulation.
- Soil: 10 ppm, provided that the soil is excavated to a minimum depth of 10 inches; the excavated soil will be replaced with clean soil (< 1 ppm PCBs) and the spill site will be restored (e.g. replacement of turf).

2.2.1.2 Recordkeeping Requirements

The responsible party will document the cleanup with records of decontamination. The records must be maintained for a period of 5 years. The records and certification consist of the date, time, and type of spill; a brief description of the spill location and the nature of the materials contaminated; if required, precleanup sampling data used to establish the spill boundaries because of insufficient visible traces; a brief description of solid surfaces cleaned; approximate depth of soil excavation and the amount of soil removed; if required, postcleanup verification sampling data with a description of the sampling methodology and analytical technique used.

2.2.1.3 Sampling Requirements

Post cleanup sampling is required to verify the level of cleanup has been achieved for Category II spills. The responsible party may use any statistically valid, reproducible, sampling scheme (either random samples or grid samples) provided the following requirements are met:

- The sampling area is the greater of (1) an area equal to the area cleaned plus an additional 1-foot boundary, or (2) an area 20 percent larger than the original area of contamination.
- The sampling scheme must ensure 95 percent confidence against false positives.
- The number of samples must be sufficient to ensure that areas of contamination with a radius of 2 feet or more within the sampling area will be detected, except that the minimum number of samples is 3 and the maximum number of samples is 40.
- The sampling scheme must include calculation for expected variability due to analytical error.

The USEPA recommends the use of a sampling scheme developed by the Midwest Research Institute (MRI). The sampling scheme is described in a document entitled, "Verification of PCB Spill Cleanup by Sampling and Analysis." Guidance for the use of the sampling scheme is provided in the manual "Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup."

2.2.2 Applicability of PCB Regulations to AFP 85 Sites

All spills at AFP 85 are considered historical. Therefore, release response actions are not discussed below. Cleanup levels, recordkeeping requirements, and sampling requirements are discussed in the following subsections.

2.2.2.1 Cleanup Levels

The USEPA has delegated to the OEPA's TSCA Office the authority for oversight of PCB spill cleanups in Ohio. The USAF and its contractors have worked with the OEPA's TSCA Office to establish the appropriate cleanup levels for PCB contaminated sites at AFP 85 (Reference 243).

Industrial standards (i.e., standards for restricted access areas) were deemed most appropriate because property within the AFP 85 boundaries has been and will continue to be used for industrial purposes. This industrial designation corresponds to a soil cleanup level of 25 ppm.

A uniform surface cleanup level was also established. All of the impervious surfaces at AFP 85 are considered low-contact areas. However, some are outdoors and some are indoors, corresponding to cleanup levels of 100 $\mu g/100cm^2$ and 10 $\mu g/100\ cm^2$ (or 100 $\mu g/100cm^2$ plus encapsulation), respectively. To date, all surfaces have been cleaned to the more conservative standard of 100 $\mu g/100\ cm^2$ plus encapsulation.

Soil PCB concentrations of 25 ppm and surface PCB concentrations of 10 $\mu g/100cm^2$ will be considered action levels during this investigation. Sites at which these levels are exceeded will be recommended for remedial action.

2.2.2.2 Recordkeeping Requirements

The USAF maintains at the Aeronautical System Center/Environmental Management (ASC/EM) (Wright-Patterson Air Force Base, Dayton, OH) files of all reports documenting environmental work conducted at AFP 85. Results from this investigation will be provided in a report which will

be submitted to and maintained by ASC/EM. This report will satisfy the USEPA's PCB Spill Cleanup Policy recordkeeping requirements summarized in Section 2.2.1.2.

2.2.2.3 Sampling Requirements

The objectives of the current investigation of PCB sites is (1) to verify that PCB spills have occurred at identified sites; (2) to determine the concentrations of PCBs at these sites; and (3) to determine, to the extent possible, the size of the contaminated area. Sampling requirements promulgated under the USEPA's PCB Spill Cleanup Policy pertain only to post cleanup sampling. Cleanup is not a component of this investigation as described above. Therefore, the sampling requirements do not apply *per se.* However, guidance on the implementation of sampling schemes used to verify cleanup (i.e., MRI's "Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup") may also be used to investigate sites. The sampling schemes given in Section 4 of this Work Plan are based on this guidance.

3.0 Summary of VAP-Ineligible Sites

The requirements of the Ohio VAP for a Phase I Property Assessment have been fulfilled by the EBS (Reference 213) and the EBS Addendum (Reference 267). This section of the Work Plan summarizes the Phase I Property Assessment findings and presents additional information not known when the assessment was finalized.

3.1 Visual Surveys

Seven visual surveys of AFP 85 have been conducted. The most recent surveys were conducted on May 19-22, 1997 and May 18-19, 1998. The 1997 survey collected information to prepare Phase I documentation, which was prepared as an addendum (Reference 267) to the EBS (Reference 213). The visual survey was conducted to:

- Update the findings of the EBS,
- Take color photographs of the site, and
- Conduct an adjacent property survey that fulfills the requirements of OAC 3745-300-06.

Adjacent properties were surveyed to identify nearby environmental concerns and potential sources of contamination migrating onto AFP 85 property, and to verify information obtained from an electronic database search of Federal and State records of adjacent properties. The survey involved interviewing individuals associated with commercial and industrial activities conducted near AFP 85 and walking the grounds of some of the properties to identify potential sources of contamination.

The visual survey conducted in 1998 was conducted to:

- Assess and photograph VAP-ineligible properties to be investigated under this Work Plan, and to
- Obtain additional historical records stored at AFP 85 that pertain to the VAP-ineligible properties.

3.2 Underground Storage Tanks

Fifty USTs historically existed or currently exist at AFP 85. USTs contained aviation fuel (JP-4 and JP-5), No. 2 fuel oil, cutting oil, water-based coolant oil, gasoline, hazardous waste, hazardous materials, waste oil, aviation gasoline, and stoddard solvent. Forty-seven USTs have been removed, two have been left in-place and filled with concrete, and one (Tank No. 548) is in use (Reference 138).

Of the fifty USTs, 3 USTs that were interim status Resource Conservation and Recovery Act (RCRA) units were granted clean closure by OEPA. Eleven USTs that were removed prior to December 22, 1988 are exempt from closure requirements (40 CFR 2800 Subtitle I) because they stored No. 2 fuel oil (Reference 308); these 11 USTs are being addressed under the Ohio VAP. The remaining 36 USTs are subject to requirements of BUSTR/OEPA: one UST is currently active, 33 have been removed, and 2 are inactive. This work plan addresses the 35 removed or inactive USTs that are subject to requirements of BUSTR/OEPA.

The following subsections provide a summary of findings for these VAP-ineligible USTs based on records searches conducted by Earth Tech for the EBS for AFP 85 (Reference 213), the AFP 85 EBS Addendum (Reference 267), and this Work Plan. Analytical data and sampling logs for soil and water were available for the majority of the USTs removed, but only limited information pertaining to the UST removals was identified. Analytical data was available for some individual tanks; however, when several USTs were located in the same area, analytical data was usually available only for the USTs as a group.

A summary of the USTs that require further investigation under BUSTR/OEPA is presented in Table 3-1. This table provides tank location, capacity and dimensions, substance stored, installation date, removal status, and a brief summary of historical analytical data.

3.2.1 IRP Site 9 - Building 3 Fuel Tank Site

The Building 3 Fuel Tank Site is comprised of two areas located by the northeast corner of Building 3. Each area contained 3 USTs that have been removed. Three USTs (Tank Nos. 103, 104, and 105) were located on the north side of the northeast corner of Building 3. UST No. 105 is being addressed under the VAP and will not be discussed further in this section except when analytical data from the excavation of UST Nos. 103, 104, and 105 as a group are presented. Three USTs (Tank Nos. 106, 107, and 108) were located on the east side of the northeast corner of Building 3. UST No. 108, which contained waste oil, was an interim status RCRA unit that has been granted clean closure by OEPA (Reference 238). UST No. 108 will not be discussed further in this section. The following subsections summarize the findings for these USTs.

3.2.1.1 UST Nos. 103 and 104 (FACNOs 3-103 and 3-104)

UST Nos. 103 and 104 (FACNOs 3-103 and 3-104) were installed in 1941 and removed before December 22, 1988, the effective date of final federal Subtitle I regulations. UST Nos. 103 and 104, which were constructed of steel, each had a capacity of 15,000 gallons and stored JP-4 jet fuel (Reference 138). UST Nos. 103 and 104 are subject to requirements of BUSTR.

In early May 1985, as part of an investigation of UST locations at AFP 85, 16 monitoring wells were installed at 16 UST locations; the monitoring wells were installed in the vicinity of the former USTs. As illustrated in Figure 3-1, one monitoring well (M-1) was installed south of UST

Table 3-1
Summary of VAP-ineligible USTs

FACNO	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Dimensions		Capacity (gallons)	Depth of Tank Bottom (bgs)	Brief History of Analytical Results
						Diameter	Length			
3-98	98	North side of Building 3	Cutting oil	1941	Removed	10' 0"	17' 2"	10,000	--	Petroleum hydrocarbons were detected in groundwater sample collected at the site. Oil and grease was detected in sample from last rinsate in triple rinse of Tank 98. Trichloroethene was detected in samples collected from excavated soil pile.
3-99	99	North side of Building 3	Water-based coolant oil	1941	Removed	10' 0"	26' 2"	15,000	9.5 feet	Petroleum hydrocarbons were detected in groundwater sample collected at the site. Oil and grease was detected in samples collected from excavation pit. Oil and grease was detected in samples from water from excavation of Tank 99. Trichloroethene and oil and grease were detected in samples collected from excavated soil pile.
3-101	101	North side of Building 3	Water-based coolant oil	1941	Removed	10' 0"	26' 2"	15,000	--	Petroleum hydrocarbons were detected in groundwater sample collected at the site. Trichloroethene and oil and grease were detected in samples collected from excavated soil pile.
3-103	103	Northeast corner of Building 3	Jet Fuel (JP-4)	1941	Removed	8' 0"	40' 4"	15,000	11.5 feet	Petroleum hydrocarbons and BTEX were detected in groundwater and soil samples collected at the site. VOCs and SVOCs were detected in standing water from area surrounding tank.
3-104	104	Northeast corner of Building 3	Jet Fuel (JP-4)	1941	Removed	8' 0"	40' 4"	15,000	11.5 feet	Petroleum hydrocarbons and BTEX were detected in groundwater and soil samples collected at the site. VOCs and SVOCs were detected in standing water from area surrounding tank.
3-106	106	Northeast corner of Building 3	Aviation Fuel	1954	Removed	5' 4"	12' 0"	2,000	--	Data was not identified during the records search.
3-107	107	Northeast corner of Building 3	Aviation Fuel	1954	Removed	5' 4"	12' 0"	2,000	--	Data was not identified during the records search.
4-FBA-1	FBA-1	East side of Building 4	Stoddard solvent	1969	Removed	6' 4"	6' 0"	1,200	9.5 feet	Petroleum hydrocarbons were detected in groundwater sample collected at the site. Oil and grease was detected in samples collected from excavation pit and from excavated soil pile.
4-FBA-2	FBA-2	East side of Building 4	Stoddard solvent	1969	Removed	6' 4"	6' 0"	1,200	--	Petroleum hydrocarbons were detected in groundwater sample collected at the site. Oil and grease was detected in samples collected from unknown location.

Table 3-1
Summary of VAP-ineligible USTs (Continued)

FACNO	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Dimensions		Capacity (gallons)	Depth of Tank Bottom (bgs)	Brief History of Analytical Results
						Diameter	Length			
5-159	159	North side of Building 5	Lacquer thinner	1954	Removed	5' 0"	19' 0"	2,500	12 feet	No constituents were quantified above detection limits in samples from excavation pit.
5-160	160	North side of Building 5	Solvent	1954	Removed	7' 0"	9' 6"	2,000	12 feet	No constituents were quantified above detection limits in samples from excavation pit.
7-257	257	Northwest of Building 7	Jet Fuel	ND	Removed	ND	ND	20,000	--	TPH, BTEX, and PAHs were detected in soil samples collected from excavation pit. Benzene, toluene, xylenes, and TPH were detected in samples collected from soil borings. Site assessment submitted to BUSTR.
9-92	92	North side of Building 9	Gasoline	1941	Removed	8' 0"	40' 0"	15,000	12.5 feet	Oil and grease and BTEX were detected in soil samples collected at the site.
10-146	146	East side of Building 10	Trichloroethane	1954	Removed	7' 0"	10' 6"	3,000	10 feet	Petroleum hydrocarbons, toluene, 1,1,1-trichloroethane, cis-1,2-dichloroethene, and trichloroethene were detected in groundwater samples collected at the site. 1,1,1-trichloroethane, cis-1,2-dichloroethene, 1,1-dichloroethane, and trichloroethene were detected in soil samples collected from borings and excavation pit.
10-147	147	East side of Building 10	Trichloroethane, Trichloroethene	1954	Removed	7' 0"	17' 6"	5,000	10 feet	Petroleum hydrocarbons, toluene, 1,1,1-trichloroethane, cis-1,2-dichloroethene, and trichloroethene were detected in groundwater samples collected at the site. 1,1,1-trichloroethane, cis-1,2-dichloroethene, toluene, and trichloroethene were detected in soil samples collected from borings and excavation pit.
10-287	287	Northeast of Building 10	Waste (PCB) oil	1964	Removed	7' 0"	21' 0"	6,000	10 feet	Petroleum hydrocarbons and VOCs were detected in groundwater samples collected at the site. Oil and grease, VOCs, and Aroclor 1248 were detected in soil samples collected from excavation pit.
10-545	545	Northwest of Building 10	Waste oil	1988	Removal	8'	27'	10,000	--	Diesel range organics, methylene chloride, and barium were detected in one soil sample collected under the vault for this tank. Methylene chloride was detected in the wipe sample collected from the wall of the vault for this tank.
10-546	546	Northwest of Building 10	Degreaser/Trichloroethane	1988	Removal	5' 4"	18'	3,000	--	Diesel range organics, dichlorodifluoromethane, methylene chloride, and barium were detected in one soil sample collected under the vault for this tank.

Table 3-1
Summary of VAP-ineligible USTs (Continued)

FACNO	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Dimensions		Capacity (gallons)	Depth of Tank Bottom (bgs)	Brief History of Analytical Results
						Diameter	Length			
21-97	97	Southeast corner Building 21 (underneath building)	Waste cutting oil	1941	Inactive (filled with concrete)	10' 0"	17' 2"	10,000	13 feet	Oil and grease and Aroclors 1248 and 1260 were detected in a sludge sample collected from Tank 97. Oil and grease, Aroclor 1248, and trans-1,2-dichloroethene were detected in soil samples collected at the site.
49-90	90	West side of Building 110	Aviation Fuel	1954	Removed	8' 0"	26' 10"	10,000	11 feet	Petroleum hydrocarbons were detected in groundwater sample collected at the site. Oil and grease and benzene were detected in samples collected from excavation pit. m-xylene was detected in samples collected from excavated soil pile.
124-161	161	South side of Building 124	Jet Fuel (JP-4)	1954	Removed	5' 6"	12' 0"	2,000	10.75 feet	Petroleum hydrocarbons were detected in groundwater sample collected at the site. Benzene, ethyl benzene, m-xylene, and o-xylene were detected in soil samples collected from excavation pit.
124-162	162	South side of Building 124	Jet Fuel (JP-4)	1954	Removed	5' 6"	12' 0"	2,000	10.75 feet	Petroleum hydrocarbons were detected in groundwater sample collected at the site. Benzene, ethyl benzene, m-xylene, and o-xylene were detected in soil samples collected from excavation pit.
124-163	163	South side of Building 124	Jet Fuel (JP-4)	1954	Removed	5' 6"	12' 0"	2,000	10.75 feet	Petroleum hydrocarbons were detected in groundwater sample collected at the site. Benzene, ethyl benzene, m-xylene, and o-xylene were detected in soil samples collected from excavation pit.
124-164	164	South side of Building 124	Jet Fuel (JP-4)	1954	Removed	5' 6"	12' 0"	2,000	10.75 feet	Petroleum hydrocarbons were detected in groundwater sample collected at the site. Benzene, ethyl benzene, m-xylene, and o-xylene were detected in soil samples collected from excavation pit.
124-165	165	South side of Building 124	Jet Fuel (JP-4)	1954	Removed	8' 0"	26' 7"	10,000	14 feet	Petroleum hydrocarbons were detected in groundwater sample collected at the site. Benzene, ethyl benzene, m-xylene, and o-xylene were detected in soil samples collected from excavation pit.
124-274	274	South side of Building 124	Jet Fuel (JP-4)	1959	Removed	8' 0"	14' 0"	5,000	12.5 feet	Petroleum hydrocarbons were detected in groundwater sample collected at the site. Benzene, ethyl benzene, m-xylene, and o-xylene were detected in soil samples collected from excavation pit.

Table 3-1
Summary of VAP-ineligible USTs (Continued)

FACNO	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Dimensions		Capacity (gallons)	Depth of Tank Bottom (bgs)	Brief History of Analytical Results
						Diameter	Length			
125-166	166	South side of Building 125	Waste oil	1956	Removed	8' 0"	27' 0"	10,000	11 feet	Petroleum hydrocarbons were detected in groundwater sample collected at the site. No constituents were quantified above detection limits in samples collected from excavation pit. Petroleum hydrocarbons, VOCs, and Aroclor 1260 were detected in a solid sample from drums associated with the UST excavation.
141-109	109	West of Building 141	Jet Fuel (JP-5)	1956	Removed	10' 6"	23' 2"	15,000	--	Toluene, barium, PHC, and phenols were detected in samples collected from excavation pile. Oil and grease was detected in samples collected from excavation pit.
141-110	110	West of Building 141	Jet Fuel (JP-5)	1956	Removed	10' 6"	23' 2"	15,000	--	Toluene, barium, PHC, and phenols were detected in samples collected from excavation pile. Oil and grease was detected in samples collected from excavation pit.
141-111	111	West of Building 141	Jet Fuel (JP-5)	1956	Removed	10' 6"	23' 2"	15,000	--	Toluene, barium, PHC, and phenols were detected in samples collected from excavation pile. Oil and grease was detected in samples collected from excavation pit.
141-215	215	West of Building 141	Jet Fuel (JP-5)	1953	Removed	10' 6"	23' 2"	15,000	--	Toluene, barium, PHC, and phenols were detected in samples collected from excavation pile. Oil and grease was detected in samples collected from excavation pit.
141-297	297	North of Building 141	Jet Fuel (JP-4)	1968	Removed	ND	ND	1,500	--	Oil and grease was detected in samples collected from east wall of excavation pit and from south excavation pile.
214-239	239	South side of Building 214	Jet Fuel (JP-4)	1957	Removed	8' 0"	27' 6"	10,000	12.5 feet	Oil and grease, m-xylene, and benzene were detected in samples collected in excavation pit. o-xylene was detected in samples collected from excavated soil.
214-240	240	South side of Building 214	Jet Fuel (JP-4)	1957	Removed	8' 0"	27' 6"	10,000	12.5 feet	Oil and grease, m-xylene, and benzene were detected in samples collected from excavation pit. o-xylene was detected in samples collected from excavated soil.
404-96	96	West side of Building 404	Lubricating oil	1938	Inactive (filled with concrete)	ND	ND	15,000	11 feet	Benzene, toluene, ethyl benzene, o-xylene and TPH were detected in soil samples collected from five borings advanced around the perimeter of the UST.

Key:
FACNO = Unique identifier assigned to each site by the EBS (Reference 213) and the EBS Addendum (Reference 267) for AFP 85
BTEX = Benzene, toluene, ethyl benzene, and xylenes
PHC = Petroleum hydrocarbons
VOCs = *Volatile Organic Compounds*
SVOCs = Semi-volatile Organic Compounds

Nos. 103 and 104 (FACNOs 3-103 and 3-104). On June 27-28, 1985, groundwater samples were collected from 14 monitoring wells; these samples were analyzed for petroleum hydrocarbons (PHC) and volatile organic compounds (VOCs). As presented in Table 3-2, PHC and BTEX were detected in the groundwater samples collected from monitoring well M-1 and were quantified as follows: PHC (334 milligrams per liter [mg/L]), benzene (197 micrograms per liter [µg/L]), toluene (149 µg/L), ethyl benzene (135 µg/L), and xylenes (75 µg/L) (Reference 303).

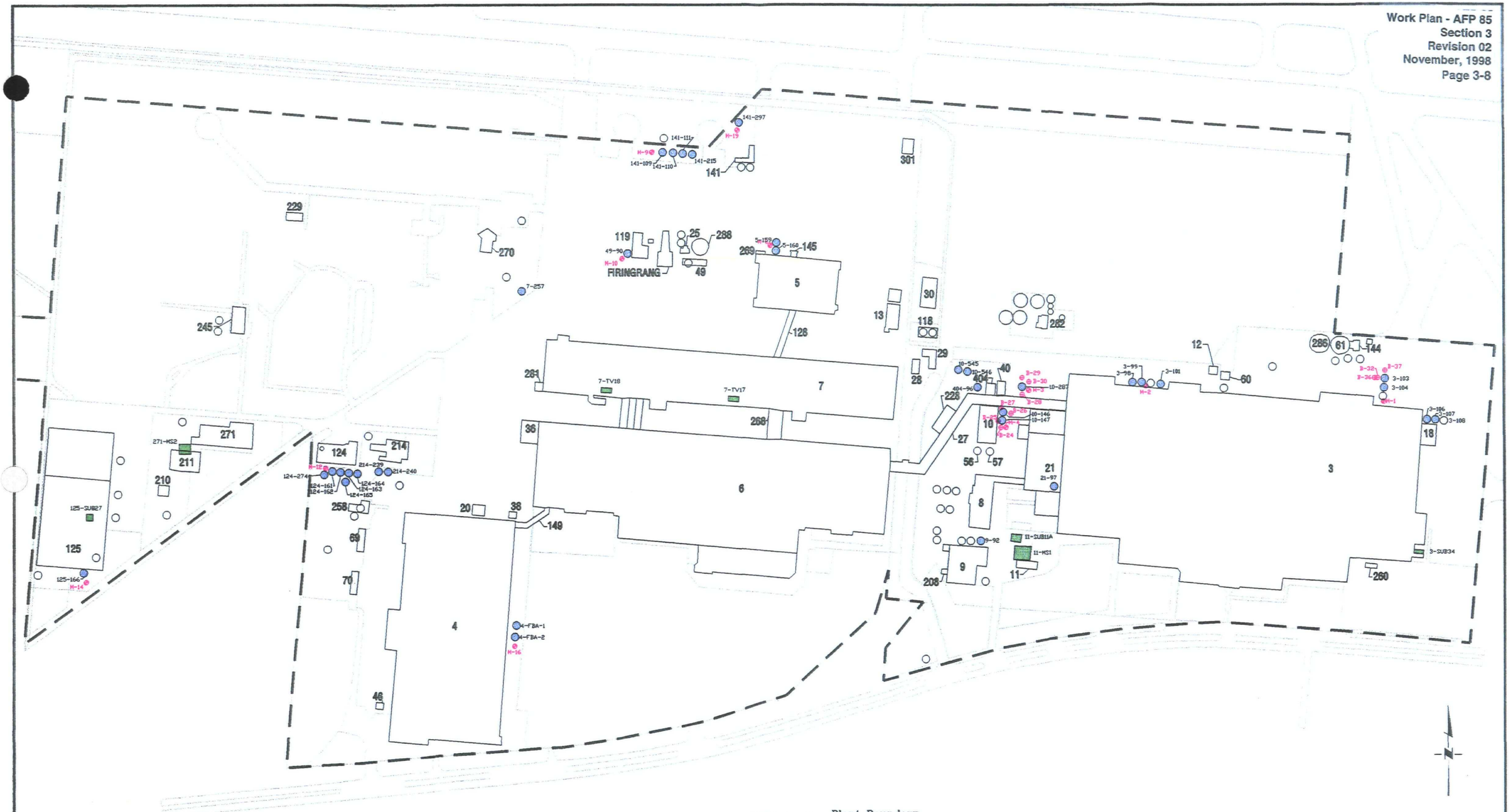
Based on these results, a soil sampling program was conducted in August-September 1985 to further identify the extent of contamination in the vicinity of UST Nos. 103 and 104. As illustrated in Figure 3-1, three borings (Nos. B-32, B-36, and B-37) were installed at UST No. 103 (FACNO 3-103). Continuous split-spoon samples were collected and soil samples were analyzed for the same VOCs as during the monitoring well sampling program conducted in June 1985. Table 3-3 presents the sample collection depths and analytical results for each sample collected from the three borings. VOCs were only detected in one sample from boring B-32: ethyl benzene was detected in the soil sample collected at 5-6 feet below ground surface (bgs) (Reference 303).

The exact removal dates for UST Nos. 103 and 104 are not known. Six soil samples were collected on August 25, 1988 and August 31, 1998 from the side walls and bottom of the excavation pit, and from the excavation pile, for UST Nos. 103, 104, and 105. Oil and grease and BTEX were detected in the six soil samples. In addition to these samples, a liquid composite sample was collected from standing water from the area surrounding the USTs. Oil and grease, PAHs, VOCs, and metals were detected in the liquid sample. On September 8, 1988 and October 6, 1988, the side walls of the excavation pit were resampled. The sample from the north side wall was analyzed for oil and grease and the samples from the other three side walls were analyzed for aromatic VOCs. No constituents were present above detection limits. The sampling location for one soil sample collected on September 19, 1988 is unknown; oil and grease, ethyl benzene, and total xylenes were quantified above detection limits. Table 3-4 presents the sample collection dates, sample locations, analyses performed, and analytical results (including detection limits) for samples collected from the excavation pit and pile (References 138 and 286).

In November 1996, as part of a sampling investigation conducted at AFP85 by the U.S. Geological Survey (USGS), four soil samples were collected from two borings (Nos. USB07 and USB08) advanced in the vicinity of USTs Nos. 103 and 104. All four samples were analyzed for volatiles (SW8240/SW8260), semivolatiles (SW8270), and pesticides/PCBs (SW8080).

A soil sample was collected at 3.1-5.0 and 5.0-8.0 feet bgs at boring USB07. The following analytes were detected in the sample collected at 3.1-5.0 feet bgs: acetone (0.047 J [estimated] mg/kg), carbon disulfide (0.0055 J mg/kg), and methylene chloride (0.0067 J mg/kg). The following analytes were detected in the sample collected at 5.0-8.0 feet bgs: acetone (0.092 J mg/kg), fluoranthene (0.46 mg/kg), 2-methylnapththalene (0.42 mg/kg), phenanthrene (0.40 mg/kg), pyrene (0.47 mg/kg), delta BHC (0.0029 mg/kg), and heptachlor epoxide (0.063 mg/kg).

A soil sample was collected at 3.0-5.5 and 9.0-9.5 feet bgs at boring USB08. The following analytes were detected in the sample collected at 3.0-5.5 feet bgs: acetone (0.15 J mg/kg), 2-



Plant Boundary

M-14 Monitoring Well

B-22 Borehole

VAP Ineligible UST Site

VAP Ineligible PCB Site

0 175 350 700

Scale in Feet

EARTH TECH

Figure 3-1

VAP Ineligible UST and PCB Sites

VAP13.DWG/3-1.PLT

Table 3-2
Groundwater Samples Collected at UST Locations on June 27-28, 1985[1][2][3]

Chemical	UST FACNOs 3-103 and 3-104 Well M-1 (µg/L)	UST FACNOs 3-98, 3-99, and 3-101 Well M-2 (µg/L)	UST FACNO 10-287 Well M-3 (µg/L)	UST FACNOs 10-146 and 10-147 Well M-4 (µg/L)	UST FACNO 49-90 Well M-10 (µg/L)
Benzene	197	ND	ND	ND	ND
Toluene	149	ND	119	45	ND
Ethyl benzene	135	ND	11	ND	ND
Xylenes	75	ND	10	ND	ND
1,1,1-trichloroethane	ND	ND	200	22	ND
cis-1,2-dichloroethene	ND	ND	34000	5000	ND
1,1-dichloroethane	ND	ND	2600	ND	ND
Vinyl chloride	ND	ND	800	ND	ND
Trichloroethene	ND	ND	ND	10	ND
Petroleum hydrocarbons (PHC) (mg/L)	334	197	14,200	24	2.5

Chemical	UST FACNOs 124-161 thru 124-165, and 124-274 Well M-12 (µg/L)	UST FACNO 125-166 Well M-14 (µg/L)	UST FACNOs 4-FBA-1 and 4-FBA-2 Well M-16 (µg/L)	UST FACNO 141-287 Well M-19 (µg/L)
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethyl benzene	ND	ND	ND	ND
Xylenes	ND	ND	ND	ND
1,1,1-trichloroethane	ND	ND	ND	ND
cis-1,2-dichloroethene	ND	ND	ND	ND
1,1-dichloroethane	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND
Petroleum hydrocarbons (PHC) (mg/L)	223	13	1.7	<0.5

Key: ND = Not Detected. Detection Limits = 1-10 µg/L.

Note:
1. Well 8 at UST FACNOs 5-159 and 5-160, and Well 9 at UST FACNOs 141-109, 141-110, 141-111, and 141-215, were dry at the time of sampling.
2. During the installation of monitoring wells in early May 1985, planned wells numbered 5, 7, and 13 were not installed.
3. Wells 6, 11, 15, 17, and 18 were installed at UST FACNOs 8-115 and 8-116, 270-289, 125-FBA3, 214-243, and 7-290. These USTs are not subject to the requirements of BUSTR and are being addressed under the Ohio VAP.

Table 3-3
Soil Samples Collected August – September 1985
from Borings B-32, B-36, and B-37 at UST No. 103 (FACNO 3-103)

Chemical	Boring B-32 Depth (5-6 feet) (mg/kg)	Boring B-32 Depth (9-10 feet) (mg/kg)	Boring B-32 Depth (12-13 feet) (mg/kg)
Location: 10 Feet West of UST No. 103 (FACNO 3-103)			
Benzene	ND	ND	ND
Toluene	ND	ND	ND
Ethyl benzene	0.10	ND	ND
Xylenes	ND	ND	ND
1,1,1-trichloroethane	ND	ND	ND
cis-1,2-dichloroethene	ND	ND	ND
1,1-dichloroethane	ND	ND	ND
Vinyl chloride	ND	ND	ND
Trichloroethene	ND	ND	ND

Chemical	Boring B-36 Depth (2-4 feet) (mg/kg)	Boring B-36 Depth (6-8 feet) (mg/kg)	Boring B-36 Depth (8-10 feet) (mg/kg)
Location: 20 Feet West of UST No. 103 (FACNO 3-103)			
Benzene	ND	ND	ND
Toluene	ND	ND	ND
Ethyl benzene	ND	ND	ND
Xylenes	ND	ND	ND
1,1,1-trichloroethane	ND	ND	ND
cis-1,2-dichloroethene	ND	ND	ND
1,1-dichloroethane	ND	ND	ND
Vinyl chloride	ND	ND	ND
Trichloroethene	ND	ND	ND

Chemicals	Boring B-37 Depth (2-4 feet) (mg/kg)	Boring B-37 Depth (6-8 feet) (mg/kg)	Boring B-37 Depth (8-10 feet) (mg/kg)	Boring B-37 Depth (10-12 feet) (mg/kg)
Location: 20 Feet North of UST No. 103 (FACNO 3-103)				
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethyl benzene	ND	ND	ND	ND
Xylenes	ND	ND	ND	ND
1,1,1-trichloroethane	ND	ND	ND	ND
cis-1,2-dichloroethene	ND	ND	ND	ND
1,1-dichloroethane	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND

Key: ND = Not detected. Detection Limits = 0.01 - 0.1 mg/kg (dry weight).

Table 3-4
Samples collected during excavation of UST Nos. 103 and 104
(FACNOs 3-103 and 3-104)

Tank Number	Sample Date	Sample Location	Matrix	Analyses
103,104,105	08/08/88	Liquid composite of liquid samples from tanks 103,104 and standing water from area surrounding tanks	Liquid	Analysis: Base Neutrals & Acids (Method 625) Detection Limit(s): 10.0 ug/L Results: Benzo(b)fluoranthene (23.6 ug/L) Bis(2-ethylhexyl)-phthalate (29.1 ug/L) Chrysene (27.0 ug/L) Fluoranthene (127 ug/L) Fluorene (93.4 ug/L) Naphthalene (152 ug/L) Phenanthrene (522 ug/L) Pyrene (58.3 ug/L) Analysis: Metals (Methods 6010,7470,7196) Detection Limit(s): 0.001 - 0.2 mg/L Results: Barium (1.00 mg/L) Copper (0.02 mg/L) Iron (8.11 mg/L) Lead (0.49 mg/L) Manganese (0.19 mg/L) Zinc (0.59 mg/L) Analysis: Oil & Grease (Method 413.1) Detection Limit(s): ND Results: Oil & Grease (823 mg/L) Analysis: PCBs (Method 608) Detection Limit(s): 1.0 ug/L Results: BDL Analysis: Total Cyanide (Method 9010) Detection Limit(s): 0.1 mg/L Results: Total cyanide (< 0.1 mg/L) Analysis: Total Phenols (Method 420.1) Detection Limit(s): ND Results: Total Phenols (1.43 mg/L) Analysis: Volatiles (Method 624) Detection Limit(s): 20.0 ug/L Results: Benzene (212 ug/L) Methylene chloride (98.7 ug/L) Toluene (69.7 ug/L) Total xylenes (827 ug/L)
103,104,105	08/25/88	Bottom of excavation pit	Soil	Analysis: Aromatic VOCs (Method 602) Detection Limit(s): 0.5 mg/kg (Xyl. 1.5) Results: Benzene (3.49 mg/kg) Ethyl benzene (2.31 mg/kg) Total xylenes (1.82 mg/kg) Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: Oil & Grease (286 mg/kg)

Table 3-4
Samples collected during excavation of UST Nos. 103 and 104
(FACNOs 3-103 and 3-104)

Tank Number	Sample Date	Sample Location	Matrix	Analyses
103,104,105	08/25/88	East wall of excavation pit	Soil	Analysis: Aromatic VOCs (Method 602) Detection Limit(s): 0.5 mg/kg (Xyl. 1.5) Results: Benzene (9.72 mg/kg) Toluene (1.30 mg/kg) Ethyl benzene (4.04 mg/kg) Total xylenes (2.60 mg/kg) Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: BDL
103,104,105	08/25/88	Excavation pile	Soil	Analysis: Aromatic VOCs (Method 602) Detection Limit(s): 0.5 mg/kg (Xyl. 1.5) Results: Benzene (4.22 mg/kg) Toluene (< 1.0 mg/kg) Ethyl benzene (5.90 mg/kg) Total xylenes (3.55 mg/kg) Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: Oil & Grease (742 mg/kg)
103,104,105	08/25/88	North wall of excavation pit	Soil	Analysis: Aromatic VOCs (Method 602) Detection Limit(s): 0.5 mg/kg (Xyl. 1.5) Results: Benzene (1.35 mg/kg) Ethyl benzene (0.885 mg/kg) Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: Oil & Grease (863 mg/kg)
103,104,105	08/25/88	West wall of excavation pit	Soil	Analysis: Aromatic VOCs (Method 602) Detection Limit(s): 0.5 mg/kg (Xyl. 1.5) Results: Benzene (6.93 mg/kg) Toluene (< 1.0) Ethyl benzene (5.30 mg/kg) Total xylenes (3.01 mg/kg) Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: BDL
103,104,105	08/31/88	South side of excavation pit	Soil	Analysis: Aromatic VOCs (Method 8020) Detection Limit(s): 0.1 mg/kg Results: Benzene (<1.0 ug/L) Toluene (10.9 ug/L) Ethyl benzene (< 1.0 ug/L) Total xylenes (< 1.0 ug/L)

Table 3-4
Samples collected during excavation of UST Nos. 103 and 104
(FACNOs 3-103 and 3-104)

Tank Number	Sample Date	Sample Location	Matrix	Analyses
103,104,105	08/31/88	South side of excavation pit	Soil	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: BDL Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: Oil & Grease (586 mg/kg) Analysis: PCBs (Method 8080) Detection Limit(s): 1.0 mg/kg Results: BDL
103,104,105	09/08/88	East excavation pit wall (Resample)	Soil	Analysis: BTEX Detection Limit(s): 0.5 mg/kg Results: BDL
103,104,105	09/08/88	North excavation pit wall (Resample)	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: BDL
103,104,105	09/08/88	West excavation pit wall (Resample)	Soil	Analysis: BTEX Detection Limit(s): 0.5 mg/kg Results: BDL
103,104,105	09/19/88	Unknown	Soil	Analysis: Aromatic VOCs (Method 602) Detection Limit(s): 0.1 mg/kg Results: Ethyl benzene (3.68 mg/kg) Total xylenes (8.04 mg/kg) Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: Oil & Grease (233 mg/kg)
103,104,105	10/06/88	South wall of excavation pit	Soil	Analysis: Aromatic VOCs (Method 8020) Detection Limit(s): ND Results: ND

Key:

ND - No data.
BDL - Below detection limit(s).
VOCs - Volatile Organic Compounds
PCBs - Polychlorinated Biphenyls
BTEX - Benzene, Toluene, Ethyl Benzene, and Xylenes
Xyl. - Xylenes

butanone (0.078 J mg/kg), 2-methylnapththalene (1.4 mg/kg), and naphthalene (0.99 mg/kg). The following analytes were detected in the sample collected at 9.0-9.5 feet bgs: acetone (0.059 J mg/kg), methylene chloride (0.011 J mg/kg), and heptachlor epoxide (0.037 mg/kg) (Reference 278).

UST Nos. 103 and 104 require further investigation under the requirements of BUSTR, and have been designated as Category 7.

3.2.1.2 UST Nos. 106 and 107 (FACNOs 3-106 and 3-107)

UST Nos. 106 and 107 (FACNOs 3-106 and 3-107) were installed in 1954 and removed prior to December 22, 1988, the effective date of final federal Subtitle I regulations. UST Nos. 106 and 107, which were constructed of steel, each had a capacity of 2,000 gallons and stored aviation fuel (Reference 138). Information pertaining to the removal of UST Nos. 106 and 107, including soil and groundwater sampling and analytical results, was not identified during the records searches conducted for the AFP 85 EBS (Reference 213), AFP 85 EBS Addendum (Reference 267), and this Work Plan.

In November 1996, as part of a sampling investigation conducted at AFP85 by the USGS, four soil samples were collected from two borings (Nos. USB05 and USB06) advanced in the vicinity of USTs Nos. 106 and 107. All four samples were analyzed for volatiles (SW8240/SW8260), semivolatiles (SW8270), and pesticides/PCBs (SW8080).

A soil sample and a replicate soil sample were collected at 11.5-13.8 feet bgs at boring USB05. The following analytes were detected in the normal sample: acetone (0.034 J mg/kg), benzene (0.097 J mg/kg), vinyl chloride (0.014 J mg/kg), and heptachlor epoxide (0.030 mg/kg). The following analytes were detected in the replicate sample: acetone (0.025 J mg/kg), benzene (0.0091 J mg/kg), ethyl benzene (0.0051 J mg/kg), xylenes (total) (0.015 J mg/kg), and 2-methylnapththalene (0.61 mg/kg). A soil sample was collected at 3.2-5.7 and 8.2-10.7 feet bgs at boring USB06. Only acetone (0.045 J mg/kg) was detected in the sample collected at 3.2-5.7 feet bgs, and only benzene (0.0088 J mg/kg) was detected in the sample collected at 8.2-10.7 feet bgs.

In addition to these soil samples, one monitoring well (No. BLD3) was installed in the vicinity of UST Nos. 106 and 107. Groundwater samples collected in December 1997 were analyzed for volatiles (SW8240/SW8260), semivolatiles (SW8270), and pesticides/PCBs (SW8080). No analytes were quantified above detection limits (Reference 278).

Because soil and groundwater samples were not analyzed for TPH which is required by BUSTR, UST Nos. 106 and 107 require further investigation under requirements of BUSTR; these USTs have been designated as Category 7.

3.2.2 UST Nos. 98, 99, 100, and 101 (FACNOs 3-98, 3-99, 3-100, and 3-101)

UST Nos. 98, 99, 100, and 101 (FACNOs 3-98, 3-99, 3-100, and 3-101) were located near the north side of Building 3. One of the USTs (Tank No.100), which had a capacity of 15,000 gallons and stored flammable waste solvents, was an interim RCRA status unit that has been granted clean closure by OEPA (Reference 236). This UST will not be discussed further in this section except when analytical data from samples collected from the excavation pile of UST Nos. 99, 100, and 101 is presented. UST Nos. 98, 99, and 101 are subject to requirements of BUSTR.

UST Nos. 98, 99, and 101 were installed in 1941 and removed before December 22, 1988, the effective date of final federal Subtitle I regulations. UST No. 98, which was constructed of steel, had a capacity of 10,000 gallons and stored cutting oil. UST Nos. 99 and 101, which were constructed of steel, each had a capacity of 15,000 gallons and stored water-based coolant oil (Reference 138).

In early May 1985, as part of an investigation of UST locations at AFP 85, 16 monitoring wells were installed at 16 UST locations; the monitoring wells were installed in the vicinity of the former USTs. As illustrated on Figure 3-1, one monitoring well (M-2) was installed near UST Nos. 98, 99, and 101 (FACNOs 3-98, 3-99, 3-101). On June 27-28, 1985, groundwater samples were collected from 14 monitoring wells; these samples were analyzed for PHC and VOCs. As presented in Table 3-2, only PHC were detected at 197 mg/L in the groundwater sample collected from monitoring well M-2 (Reference 303).

The exact removal dates for UST Nos. 98, 99, and 101 are not known. Four soil samples were collected on December 14, 1988 from three side walls and the bottom of the excavation pit for UST No. 99. These samples were analyzed for oil and grease, and for aromatic and halogenated VOCs. Only oil and grease was detected in these soil samples at concentrations ranging from 1,540 to 16,400 mg/kg. In addition to these soil samples, a liquid sample was collected from water from the excavation of UST No. 99. Only oil and grease was detected at 48,500 mg/L in the liquid sample. On December 22, 1988, the three side walls of the excavation pit for UST No. 99 were resampled and analyzed for oil and grease. Oil and grease was not quantified above detection limits. Limited information was available for UST Nos. 98 and 101. One soil sample collected from the excavation pile of UST Nos. 99, 100, and 101 was analyzed for oil and grease, and for aromatic and halogenated VOCs; oil and grease and trichloroethene were detected at 5,400 and 1.37 mg/kg, respectively. One soil sample was collected from the excavation pile of UST Nos. 98, 99, and 101 and was analyzed for halogenated VOCs; trichloroethene was detected at 2.25 mg/kg. Table 3-5 presents the sample collection dates, sample locations, analyses performed, and the analytical results (including detection limits) for samples collected from the excavation of UST Nos. 98, 99, and 101 (References 138, 286).

UST Nos. 98, 99, and 101 require further investigation under requirements of BUSTR and OEPA; these USTs have been designated as Category 7.

3.2.3 UST Nos. FBA-1 and FBA-2 (FACNOs 4-FBA-1 and 4-FBA-2)

UST Nos. FBA-1 and FBA-2 (FACNOs 4-FBA-1 and 4-FBA-2) were located near the east side of Building 4. The USTs were installed in 1969 and removed before December 22, 1988, the effective date of final federal Subtitle I regulations. Constructed of steel, each tank had a capacity of 1,200 gallons and stored stoddard solvent.

In early May 1985, as part of an investigation of UST locations at AFP 85, 16 monitoring wells were installed at 16 UST locations; the monitoring wells were installed in the vicinity of the former USTs. As illustrated in Figure 3-1, one monitoring well (M-16) was installed south of UST No. FBA-2 (FACNO 4-FBA-2). On June 27-28, 1985, groundwater samples were collected from 14 monitoring wells; these samples were analyzed for PHC and VOCs. As presented in Table 3-2, only PHC were detected at 1.7 mg/L in the groundwater sample collected from monitoring well M-16 (Reference 303).

Table 3-5
Samples collected during excavation of UST Nos. 98, 99, and 101
(FACNOs 3-98, 3-99, and 3-101)

Tank Number	Sample Date	Sample Location	Matrix	Analyses
98	11/21/88	Last rinsate from triple rinse of tank 98	Liquid	Analysis: Oil & Grease (Method 413.1) Detection Limit(s): 5.0 mg/L Results: Oil & Grease (105 mg/L)
98,99,101	01/06/89	Excavation pile from tanks 98,99,101	Soil	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: Trichloroethene (2.25 mg/kg)
99	12/14/88	Water from excavation of tank 99	Liquid	Analysis: BTEX Detection Limit(s): 1.0 mg/kg Results: BDL Analysis: Halogenated VOCs Detection Limit(s): 200 mg/kg Results: BDL Analysis: Oil & Grease (Method 413.1) Detection Limit(s): 100 mg/kg Results: Oil & Grease (48500 mg/L: Volumetric % used to calculate value)
99	12/14/88	Bottom of excavation pit	Soil	Analysis: Aromatic VOCs (Method 8020) Detection Limit(s): 1.0 mg/kg Results: BDL Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: BDL Analysis: Oil & Grease (Method 503D) Detection Limit(s): 100 mg/kg Results: Oil & Grease (1540 mg/kg)
99	12/14/88	North wall of excavation pit	Soil	Analysis: Aromatic VOCs (Method 8020) Detection Limit(s): 1.0 mg/kg Results: BDL Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: BDL Analysis: Oil & Grease (Method 503D) Detection Limit(s): 100 mg/kg Results: Oil & Grease (6640 mg/kg)

Table 3-5
Samples collected during excavation of UST Nos. 98, 99, and 101
(FACNOs 3-98, 3-99, and 3-101)

Tank Number	Sample Date	Sample Location	Matrix	Analyses
99	12/14/88	South wall of excavation pit	Soil	Analysis: Aromatic VOCs (Method 8020) Detection Limit(s): 1.0 mg/kg Results: BDL Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: BDL Analysis: Oil & Grease (Method 503D) Detection Limit(s): 100 mg/kg Results: Oil & Grease (16400 mg/kg)
99	12/14/88	West wall of excavation pit	Soil	Analysis: Aromatic VOCs (Method 8020) Detection Limit(s): 1.0 mg/kg Results: BDL Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: BDL Analysis: Oil & Grease (Method 503D) Detection Limit(s): 100 mg/kg Results: Oil & Grease (10800 mg/kg)
99	12/16/88	Rinsate from tank 99	Liquid	Analysis: BTEX Detection Limit(s): 1.0 mg/kg Results: BDL Analysis: Halogenated VOCs Detection Limit(s): 100 ug/L Results: BDL Analysis: Oil & Grease (Method 413.1) Detection Limit(s): 100 mg/kg Results: Oil & Grease (109 mg/L)
99	12/22/88	North wall of excavation pit	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 100 mg/kg Results: BDL
99	12/22/88	South wall of excavation pit	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 100 mg/kg Results: BDL

Table 3-5
Samples collected during excavation of UST Nos. 98, 99, and 101
(FACNOs 3-98, 3-99, and 3-101)

Tank Number	Sample Date	Sample Location	Matrix	Analyses	
99	12/22/88	West wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Oil & Grease (Method 503D) 100 mg/kg BDL
99,100,101	12/14/88	Clean pile	Soil	Analysis: Detection Limit(s): Results: Analysis: Detection Limit(s): Results: Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 8020) 1.0 mg/kg BDL Halogenated VOCs (Method 8010) 1.0 mg/kg BDL Oil & Grease (Method 503D) 100 mg/kg BDL
99,100,101	12/14/88	Dirty pile	Soil	Analysis: Detection Limit(s): Results: Analysis: Detection Limit(s): Results: Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 8020) 1.0 mg/kg BDL Halogenated VOCs (Method 8010) 1.0 mg/kg Trichloroethene (1.37 mg/kg) Oil & Grease (Method 503D) 100 mg/kg Oil & Grease (5400 mg/kg)

Key:

ND - No data.
BDL - Below detection limit(s).
VOCs - Volatile Organic Compounds
BTEX - Benzene, Toluene, Ethyl Benzene, and Xylenes

The exact removal dates for UST Nos. FBA-1 and FBA-2 are not known. Six soil samples were collected on August 25, 1987 from the side walls and bottom of the excavation pit, and from the excavation pile, for UST No. FBA-1. These samples were analyzed for oil and grease and halogenated VOCs. Only oil and grease was detected at 10,900 and 351 mg/kg in the samples collected from the north and east wall of the excavation pit, respectively. Limited information was available for UST No. FBA-2: oil and grease was detected in a solid sample collected from an unknown location associated with both UST Nos. FBA-1 and FBA-2. Table 3-6 presents the sample collection dates, sample locations, analyses performed, and the analytical results (including detection limits) for samples collected from the excavation pit and pile (References 138, 286).

UST Nos. FBA-1 and FBA-2 require further investigation under requirements of BUSTR, and have been designated as Category 7.

3.2.4 UST Nos. 159 and 160 (FACNOs 5-159 and 5-160)

UST Nos. 159 and 160 (FACNOs 5-159 and 5-160) were located near the north side of Building 5. The USTs were installed in 1954 and removed before December 22, 1988, the effective date of final federal Subtitle I regulations. UST No. 159, which was constructed of steel, had a capacity of 2,500 gallons and stored flammable solvents, probably lacquer thinner. UST No. 160, which was constructed of steel, had a capacity of 2,000 gallons and stored a flammable solvent used for painting.

In early May 1985, as part of an investigation of UST locations at AFP 85, 16 monitoring wells were installed at 16 UST locations; the monitoring wells were installed in the vicinity of the former USTs. As illustrated on Figure 3-1, one monitoring well (M-8) was installed at UST Nos. 159 and 160 (FACNOs 5-159 and 5-160). On June 27-28, 1985, groundwater samples were collected from 14 monitoring wells; however, a sample could not be collected from monitoring well M-8 because the well was dry at the time of sampling (Reference 303).

The exact removal dates for UST Nos. 159 and 160 are not known. Soil samples were collected on August 20, 1987 from the side walls and bottom of the excavation pit for these USTs; these samples were analyzed for aromatic VOCs. No constituents were quantified above detection limits. Table 3-7 presents the sample collection dates, sample locations, analyses performed, and the analytical results (including detection limits) for samples collected from the excavation pit (References 138, 286).

Because samples were analyzed only for aromatic VOCs, additional sampling is required for non-halogenated VOCs. UST Nos. 159 and 160 require further investigation under requirements of BUSTR and OEPA; these USTs have been designated as Category 7.

3.2.5 UST No. 257 (FACNO 7-257)

UST No. 257 (FACNO 7-257) was located northwest of Building 7. The UST was removed in June 1993. Constructed of steel, the tank had a capacity of 20,000 gallons and stored JP-4 jet fuel (Reference 244).

During the removal of the UST, approximately 1,500 gallons of free product were observed and pumped. Five soil samples were collected from the tank excavation; TPH, BTEX, and PAHs were quantified at concentrations that exceeded detection limits. The contaminants and

Table 3-6
Samples collected during excavation of UST Nos. FBA 1 and FBA 2
(FACNOs 4-FBA-1 and 4-FBA-2)

Tank Number	Sample Date	Sample Location	Matrix	Analyses	
FBA 1 & 2		Unknown	Solid	Analysis: Detection Limit(s): Results:	Oil & Grease 250 mg/kg Oil & Grease (312 mg/kg) **
FBA-1	08/25/87	Bottom of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Halogenated VOCs (Method 601) 1.0 mg/kg BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL
FBA-1	08/25/87	East wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Halogenated VOCs (Method 601) 1.0 mg/kg BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg Oil & Grease (351 mg/kg)
FBA-1	08/25/87	Excavated soil	Soil	Analysis: Detection Limit(s): Results:	Halogenated VOCs (Method 601) 1.0 mg/kg BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL
FBA-1	08/25/87	North wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Halogenated VOCs (Method 601) 1.0 mg/kg BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg Oil & Grease (10900 mg/kg)
FBA-1	08/25/87	South wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Halogenated VOCs (Method 601) 1.0 mg/kg BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL

Table 3-6
Samples collected during excavation of UST Nos. FBA 1 and FBA 2
(FACNOs 4-FBA-1 and 4-FBA-2)

Tank Number	Sample Date	Sample Location	Matrix	Analyses	
FBA-1	08/25/87	West wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Halogenated VOCs (Method 601) 1.0 mg/kg BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL

Key:
ND - No data.
BDL - Below detection limit(s).
VOCs - Volatile Organic Compounds

Table 3-7
Samples collected during excavation of UST Nos. 159 and 160 (FACNOs 5-159 and 5-160)

Tank Number	Sample Date	Sample Location	Matrix		Analyses
159,160	08/20/87	Bottom of excavation pit	Small Stone (Fill)	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg BDL
159,160	08/20/87	East excavation pit	Small Stone (Fill)	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg BDL
159,160	08/20/87	East wall of excavation pit	Small Stone (Fill)	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg BDL
159,160	08/20/87	North wall of excavation pit	Small Stone (Fill)	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg BDL
159,160	08/20/87	South wall of excavation pit	Small Stone (Fill)	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg BDL
159,160	08/20/87	West wall of excavation pit	Small Stone (Fill)	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg BDL

Key:
ND - No data.
BDL - Below detection limit(s).
VOCs - Volatile Organic Compounds

maximum concentrations were as follows: benzene (3 micrograms per kilogram [µg/kg]), toluene (24 µg/kg), ethyl benzene (2 µg/kg), o-xylene (8 µg/kg), and TPH (336 mg/kg) (Reference 127). In addition, PAHs were detected in one sample at concentrations ranging from 27 mg/kg (naphthalene) to 218 mg/kg (fluoranthene); benzo(a)pyrene was detected at 68 mg/kg (Reference 127).

A Phase II subsurface investigation and report was completed by McDonnell-Douglas and submitted to BUSTR on June 17, 1993 (Reference 66). Three soil borings were installed each to a depth of 28 feet bgs in the vicinity of the dispenser and the tank excavation boundary. Continuous split-spoon samples were collected during the advance of each boring. At each boring, the sample with the highest PID reading occurred at a depth of 24 feet; these samples were sent to a laboratory for analysis. The following maximum concentrations were quantified in the samples: benzene (3 µg/kg), toluene (21 µg/kg), total xylenes (7 µg/kg), and TPH (37 mg/kg). Results of the Phase II investigation indicated that the tank and system have probably not significantly impacted the soils, and that the groundwater has not been impacted (Reference 66).

On March 9, 1994, BUSTR required McDonnell Douglas to perform a site assessment in accordance with OAC 1301:7-9-13 to define the horizontal and vertical extent of soil and groundwater contamination (Reference 44). The assessment report concluded that the extent of the contamination appears to have been confined to the fill material within the excavation. During boring activities for the Phase II subsurface investigation described above, auger refusal was encountered at approximately 24 feet and no groundwater was detected in any of the borings. The site assessment report concluded that this indicates groundwater is not present in the area and, therefore, is not impacted by the release from the UST system (Reference 269). This site assessment report was submitted by ASC/EM to BUSTR on September 10, 1997 (Reference 269). ASC/EM is waiting for BUSTR to require either no further action or additional investigation and/or remediation at this site.

3.2.6 UST No. 92 (FACNO 9-92)

UST No. 92 (FACNO 9-92) was located near the north side of Building 9. The UST was installed in 1941 and removed before December 22, 1988, the effective date of final federal Subtitle I regulations. Constructed of steel, the tank had a capacity of 15,000 gallons and stored gasoline (Reference 138).

The exact removal date for UST No. 92 is not known. One soil sample was collected on September 18, 1987 from the excavation pile; one composite soil sample was collected on September 24, 1987 from the north and south excavation side walls; and one composite soil sample was collected on September 29, 1987 from unknown locations in the excavation pit. All three samples were analyzed for oil and grease which was detected at 312 mg/kg in the sample collected from the excavation pile, and at 2670 mg/kg in the composite sample collected from the excavation side walls. Oil and grease was not detected in the composite sample collected from an unknown location in the excavation pit. One composite soil sample was collected on September 18, 1987 from an unknown location. The sample was analyzed for oil and grease which was detected at 819 mg/kg. Seven solid samples were also collected for UST No. 92 from unknown locations and on unknown sampling dates. Oil and grease was detected in 6 of the 7 samples, and BTEX was detected in 2 of the 7 samples. Table 3-8 presents the sample

Table 3-8
Samples collected during excavation of UST No. 92
(FACNO 9-92)

Tank Number	Sample Date	Sample Location	Matrix	Analyses
92	09/18/87	Excavation Pile	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): ND Results: Oil & Grease (312 mg/kg)
92	09/18/87	Unknown	Soil (Composite)	Analysis: Oil & Grease (Method 503D) Detection Limit(s): ND Results: Oil & Grease (819 mg/kg)
92	09/24/87	North & South excavation pit walls	Soil (Composite)	Analysis: Oil & Grease (Method 413.1) Detection Limit(s): ND Results: Oil & Grease (2670 mg/kg)
92	09/29/87	Excavation pit	Soil (Composite)	Analysis: Oil & Grease (Method 413.1) Detection Limit(s): 200 mg/kg Results: BDL
92		Unknown	Solid	Analysis: BTEX Detection Limit(s): 1.0 mg/kg Results: BDL Analysis: Oil & Grease Detection Limit(s): 250 mg/kg Results: Oil & Grease (930 mg/kg) **
92		Unknown	Solid	Analysis: BTEX Detection Limit(s): 1.0 mg/kg Results: Benzene (2.73 mg/kg) Toluene (2.07 mg/kg) Ethyl benzene (1.97 mg/kg) p-xylene (2.33 mg/kg) m-xylene (2.19 mg/kg) o-xylene (2.43 mg/kg) ** Analysis: Oil & Grease Detection Limit(s): 250 mg/kg Results: Oil & Grease (622 mg/kg)
92		Unknown	Solid	Analysis: BTEX Detection Limit(s): 1.0 mg/kg Results: Benzene (2.92 mg/kg) Ethyl benzene (1.00 mg/kg) p-xylene (1.14 mg/kg) m-xylene (1.43 mg/kg) o-xylene (1.40 mg/kg) **

Table 3-8
Samples collected during excavation of UST No. 92
(FACNO 9-92)

Tank Number	Sample Date	Sample Location	Matrix	Analyses	
92		Unknown	Solid	Analysis: Detection Limit(s): Results:	Oil & Grease 250 mg/kg Oil & Grease (548 mg/kg)
92		Unknown	Solid	Analysis: Detection Limit(s): Results: Analysis: Detection Limit(s): Results:	BTEX 1.0 mg/kg BDL Oil & Grease 250 mg/kg Oil & Grease (336 mg/kg) **
92		Unknown	Solid	Analysis: Detection Limit(s): Results: Analysis: Detection Limit(s): Results:	BTEX 1.0 mg/kg BDL Oil & Grease 250 mg/kg BDL
92		Unknown	Solid	Analysis: Detection Limit(s): Results: Analysis: Detection Limit(s): Results:	BTEX 1.0 mg/kg BDL Oil & Grease 250 mg/kg Oil & Grease (453 mg/kg) **

Key:

** - The laboratory analytical report for this data was not identified during the records search for this Work Plan. The data is based on a handwritten O.H. Materials Corporation laboratory data sheet.

ND - No data.

BDL - Below detection limit(s).

BTEX - Benzene, Toluene, Ethyl Benzene, and Xylenes.

collection dates, sample locations, analyses performed, and the analytical results (including detection limits) for the samples collected for UST No. 92 (References 138, 286).

The UST site requires further investigation under requirements of BUSTR, and has been designated as Category 7.

3.2.7 UST Nos. 146 and 147 (FACNOs 10-146 and 10-147)

UST Nos. 146 and 147 (FACNOs 10-146 and 10-147) were located east of Building 10. The USTs were installed in 1954 and were removed before December 22, 1988, the effective date of final federal Subtitle I regulations. UST No. 146, which was constructed of steel, had a capacity of 3,000 gallons and stored trichloroethane. UST No. 147, which was constructed of steel, had a capacity of 5,000 gallons and stored trichloroethane and trichloroethene (Reference 138).

In early May 1985, as part of an investigation of UST locations at AFP 85, 16 monitoring wells were installed at 16 UST locations; the monitoring wells were installed in the vicinity of the former USTs. As illustrated on Figure 3-1, one monitoring well (M-4) was installed at UST Nos. 146 and 147 (FACNOs 10-146 and 10-147). On June 27-28, 1985, groundwater samples were collected from 14 monitoring wells; these samples were analyzed for PHC and VOCs. As presented in Table 3-2, PHC and VOCs were detected in the groundwater samples collected from monitoring well M-4 and were quantified as follows: PHC (24 mg/L), toluene (45 µg/L), 1,1,1-trichloroethane (22 µg/L), cis-1,2-dichloroethene (5,000 µg/L), and trichloroethene (10 µg/L) (Reference 303).

Based on these results, a soil sampling program was conducted in August-September 1985 to further identify the extent of contamination in the vicinity of UST Nos. 146 and 147. As illustrated in Figure 3-1, four borings (Nos. B-24, B-25, B-26, and B-27) were installed at UST Nos. 146 and 147. Continuous split-spoon samples were collected and soil samples were analyzed for the same VOCs as during the monitoring well sampling program conducted in June 1985. Table 3-9 presents the sample collection depths and analytical results for the samples collected from borings B-24, B-25, B-26 and B-27. Trichloroethene and toluene were detected in the soil samples collected from boring B-24; toluene, trichloroethene (at 1,170 mg/kg), 1,1,1-trichloroethane, and cis-1,2-dichloroethene were detected in the soil samples collected from boring B-25; 1,1,1-trichloroethane, cis-1,2-dichloroethene, 1,1-dichloroethane, and trichloroethene were detected in the soil samples collected at boring B-26; and trichloroethene was detected in the soil samples collected at boring B-27 (Reference 303).

The exact removal dates for UST Nos. 146 and 147 are not known. Thirteen soil samples were collected on September 2, 1988 from the side walls and bottom of the excavation pit, the excavation pile, and under product lines for these USTs. All thirteen soil samples were analyzed for halogenated VOCs. Trichloroethene was detected in 10 samples ranging from 1.03 to 46.9 mg/kg, and 1,1,1-trichoroethane was detected in all 13 samples ranging from 0.55 to 97.5 mg/kg. Four soil samples were collected from an unknown sampling location on September 19, 1988; methylene chloride was detected in one sample, and 1,1,1-trichloroethane was detected in 3 of 4 samples. A solid sample was collected on November 10, 1988 from drums containing excavation material from UST Nos. 146 and 147. A liquid sample was also collected on November 10, 1988 from a drum associated with the excavation of UST No. 147. Both samples were analyzed for halogenated VOCs. The following were detected in the solid sample: 1,1-

Table 3-9
Soil Samples Collected August – September 1985
from Borings B-24, B-25, B-26, and B-27 at UST Nos. 146 and 147
(FACNOs 10-146 and 10-147)

Chemical	Boring B-24 Depth (3-5 feet) (mg/kg)	Boring B- 24 Depth (5-7 feet) (mg/kg)	Boring B-24 Depth (11-13 feet) (mg/kg)	Boring B- 24 Depth (15-17 feet) (mg/kg)	Boring B-24 Depth (30-32 feet) (mg/kg)
Location: 10 Feet South of UST No. 147 (FACNO 10-147)					
Benzene	ND	ND	ND	ND	ND
Toluene	ND	ND	0.64	ND	0.03
Ethyl benzene	ND	ND	ND	ND	ND
Xylenes	ND	ND	ND	ND	ND
1,1,1-trichloroethane	ND	ND	ND	ND	ND
cis-1,2-dichloroethene	ND	ND	ND	ND	ND
1,1-dichloroethane	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	5.4	0.36	0.04

Chemical	Boring B-25 Depth (3-4 feet) (mg/kg)	Boring B-25 Depth (7-8 feet) (mg/kg)	Boring B-25 Depth (9-10 feet) (mg/kg)	Boring B-25 Depth (11-12 feet) (mg/kg)	Boring B-25 Depth (15-16 feet) (mg/kg)
Location: 5 Feet West of UST No. 147 (FACNO 10-147)					
Benzene	ND	ND	ND	ND	ND
Toluene	ND	ND	0.09	1.39	21.5
Ethyl benzene	ND	ND	ND	ND	ND
Xylenes	ND	ND	ND	ND	ND
1,1,1-trichloroethane	ND	ND	ND	ND	2.33
cis-1,2-dichloroethene	ND	ND	ND	ND	2.43
1,1-dichloroethane	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND
Trichloroethene	0.04	0.08	3.77	6.58	1170

Table 3-9
Soil Samples Collected August – September 1985 from Borings B-24, B-25, B-26, and B-27 at UST Nos. 146 and 147 (FACNOs 10-146 and 10-147) (Continued)

Chemical	Boring B-26 Depth (3-5 feet) (mg/kg)	Boring B-26 Depth (8-9 feet) (mg/kg)	Boring B-26 Depth (13-15 feet) (mg/kg)
Location: 10 Feet East of UST No. 146 (FACNO 10-146)			
Benzene	ND	ND	ND
Toluene	ND	ND	ND
Ethyl benzene	ND	ND	ND
Xylenes	ND	ND	ND
1,1,1-trichloroethane	ND	0.36	ND
cis-1,2-dichloroethene	ND	0.65	0.10
1,1-dichloroethane	ND	0.16	0.37
Vinyl chloride	ND	ND	ND
Trichloroethene	0.04	2.30	0.30

Chemical	Boring B-27 Depth (4-5 feet) (mg/kg)	Boring B-27 Depth (8-9 feet) (mg/kg)	Boring B-27 Depth (14-15 feet) (mg/kg)	Boring B-27 Depth (17-18 feet) (mg/kg)
Location: 10 Feet North of UST No. 146 (FACNO 10-146)				
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethyl benzene	ND	ND	ND	ND
Xylenes	ND	ND	ND	ND
1,1,1-trichloroethane	ND	ND	ND	ND
cis-1,2-dichloroethene	ND	ND	ND	ND
1,1-dichloroethane	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND
Trichloroethene	0.22	2.52	ND	0.55

Key: ND = Not detected. Detection Limits = 0.01 - 0.1 mg/kg (dry weight).

dichloroethane (272,000 µg/kg), 1,1-dichloroethene (419,000 µg/kg), trichloroethene (25,000 µg/kg), and 1,1,1-trichloroethane (6,490,000 µg/kg). The following were detected in the liquid sample: 1,1-dichloroethane (26,900 µg/L), 1,1-dichloroethene (35,800 µg/L), and 1,1,1-trichloroethane (541,000 µg/L). Table 3-10 presents the sample collection dates, sample locations, analyses performed, and the analytical results (including detection limits) for samples collected from the excavation pit and pile (References 138, 286). In addition to these results, samples from the excavation contained toluene and 1,2-dicholorethene at concentrations that exceeded detection limits (Reference 138).

UST Nos. 146 and 147 require additional investigation under requirements of BUSTR and OEPA; these USTs have been designated as Category 7.

3.2.8 UST No. 287 (FACNO 10-287)

UST No. 287 (FACNO 10-287) was located northeast of Building 10. The UST was installed in 1964 and removed before December 22, 1988, the effective date of final Federal Subtitle I regulations. Constructed of steel, the tank had a capacity of 6,000 gallons and stored waste oil and waste coolant oil (Reference 138).

In early May, 1985, as part of an investigation of UST locations at AFP 85, 16 monitoring wells were installed at 16 UST locations; the monitoring wells were installed in the vicinity of the former tanks. As illustrated in Figure 3-1, one monitoring well (M-3) was installed at UST No. 287 (FACNO 10-287). A groundwater sample was collected from monitoring well M-3 on May 29, 1985 and was analyzed for qualitative characteristics (i.e., presence of oil, clarity, and odor). Based on these results, monitoring well M-3 had an 8-inch layer of oil present. On June 27-28, 1985, groundwater samples were collected from 14 monitoring wells; these samples were analyzed for PHC and VOCs. As presented in Table 3-2, PHC and VOCs were detected in the groundwater samples collected from monitoring well M-3 and were quantified as follows: PHC (14,200 mg/L), toluene (119 µg/L), ethyl benzene (11 µg/L), xylenes (10 µg/L), 1,1,1-trichloroethane (200 µg/L), cis-1,2-dichloroethene (34,000 µg/L), 1,1-dichloroethane (2,600 µg/L), and vinyl chloride (800 µg/L) (Reference 303).

Based on these results, a soil sampling program was conducted in August-September 1985 to further identify the extent of contamination in the vicinity of UST No. 287. As illustrated in Figure 3-1, three borings (Nos. B-28, B-29, and B-30) were installed near UST No. 287. Continuous split-spoon samples were collected and soil samples were analyzed for the same VOCs as during the monitoring well sampling investigation conducted in June 1985. Table 3-11 presents the sample collection depths and analytical results for the samples collected from borings B-28, B-29 and B-30. Trichloroethene was detected from 0.62 to 6.90 mg/kg in the four soil samples collected from boring No. B-28; trichloroethene was detected at 0.12 mg/kg in the soil sample collected at 5-6 feet bgs from boring No. B-29, and benzene was detected at 0.11 mg/kg in the soil sample collected at 11-12 feet bgs from boring No. B-29. (Reference 303).

The exact removal date for UST No. 287 is not known. Liquids from the vacuum truck clean out of UST No. 287 by vacuum truck were characterized as waste PCB oils (Reference 311). Six soil samples were collected on September 23, 1988 from the side walls and bottom of the excavation pit, and from the excavation pile, for UST No. 287. These samples were analyzed for oil and grease, VOCs, and PCBs. Oil and grease and VOCs were quantified above detection

Table 3-10
Samples collected during excavation of UST Nos. 146 and 147
(FACNOs 10-146 and 10-147)

Tank Number	Sample Date	Sample Location	Matrix	Analyses
146,147	09/02/88	Bottom excavation pit	Soil	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: Trichloroethene (4.60 mg/kg) 1,1,1-trichloroethane (7.22 mg/kg)
146,147	09/02/88	Bottom excavation pit	Soil	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: Trichloroethene (1.63 mg/kg) 1,1,1-trichloroethane (32.9 mg/kg)
146,147	09/02/88	Clean pile	Soil	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: Trichloroethene (2.90 mg/kg) 1,1,1-trichloroethane (93.3 mg/kg)
'6,147	09/02/88	Dirty pile	Soil	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: Trichloroethene (46.9 mg/kg) 1,1,1-trichloroethane (48.1 mg/kg)
146,147	09/02/88	East excavation pit wall	Soil	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: 1,1,1-trichloroethane (97.5 mg/kg)
146,147	09/02/88	East excavation pit wall	Soil	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: Trichloroethene (4.25 mg/kg) 1,1,1-trichloroethane (57.8 mg/kg)
146,147	09/02/88	North excavation pit wall	Soil	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: Trichloroethene (3.14 mg/kg) 1,1,1-trichloroethane (34.2 mg/kg)
146,147	09/02/88	North excavation pit wall	Soil	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: Trichloroethene (1.59 mg/kg) 1,1,1-trichloroethane (40.3 mg/kg)

Table 3-10
Samples collected during excavation of UST Nos. 146 and 147
(FACNOs 10-146 and 10-147)

Tank Number	Sample Date	Sample Location	Matrix	Analyses
146,147	09/02/88	South excavation pit wall	Soil	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: 1,1,1-trichloroethane (25.2 mg/kg)
146,147	09/02/88	South excavation pit wall	Soil	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: Trichloroethene (5.18 mg/kg) 1,1,1-trichloroethane (60.4 mg/kg)
146,147	09/02/88	Under product lines going into building	Soil	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: 1,1,1-trichloroethane (5.64 mg/kg)
146,147	09/02/88	West excavation pit wall	Soil	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: Trichloroethene (1.03 mg/kg) 1,1,1-trichloroethane (25.3 mg/kg)
146,147	09/02/88	West excavation pit wall	Soil	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: Trichloroethene (1.03 mg/kg) 1,1,1-trichloroethane (18.3 mg/kg)
146,147	09/19/88	Unknown	Soil	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 0.5 mg/kg Results: 1,1,1-trichloroethane (0.67 mg/kg)
146,147	09/19/88	Unknown	Soil	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 0.5 mg/kg Results: Methylene chloride (0.52 mg/kg) 1,1,1-trichloroethane (0.55 mg/kg)
146,147	09/19/88	Unknown	Soil	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 0.5 mg/kg Results: 1,1,1-trichloroethane (0.59 mg/kg)

Table 3-10
Samples collected during excavation of UST Nos. 146 and 147
(FACNOs 10-146 and 10-147)

Tank Number	Sample Date	Sample Location	Matrix		Analyses
146,147	09/19/88	Unknown	Soil	Analysis: Detection Limit(s): Results:	Halogenated VOCs (Method 8010) 0.5 mg/kg BDL
146,147	11/10/88	Drums 4604-(61to66) from tanks 146,147	Solid	Analysis: Detection Limit(s): Results:	Halogenated VOCs (Method 8010) 20,000 ug/kg 1,1-dichloroethane (272000 ug/kg) 1,1-dichloroethene (419000 ug/kg) Trichloroethene (25000 ug/kg) 1,1,1-trichloroethane (6490000 ug/kg)
147	11/10/88	Drum 4606-60 from tank 147	Liquid	Analysis: Detection Limit(s): Results:	Halogenated VOCs (Method 601) 10,000 ug/L 1,1-dichloroethane (26900 ug/L) 1,1-dichloroethene (35800 ug/L) 1,1,1-trichloroethane (541000 ug/L)

-y:
ND - No data.
BDL - Below detection limit(s).
VOCs - Volatile Organic Compounds.

Table 3-11
Soil Samples Collected August – September 1985
from Borings B-28, B-29, and B-30 at UST No. 287 (FACNO 10-287)

Chemical	Boring B-28 Depth (2-3 feet) (mg/kg)	Boring B-28 Depth (6-7 feet) (mg/kg)	Boring B-28 Depth (14-15 feet) (mg/kg)	Boring B-28 Depth (21-22 feet) (mg/kg)
Location: 10 Feet South of Tank No. 287 (FACNO 10-287)				
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethyl benzene	ND	ND	ND	ND
Xylenes	ND	ND	ND	ND
1,1,1-trichloroethane	ND	ND	ND	ND
cis-1,2-dichloroethene	ND	ND	ND	ND
1,1-dichloroethane	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND
Trichloroethene	0.62	1.10	4.68	6.90

Chemical	Boring B-29 Depth (5-6 feet) (mg/kg)	Boring B-29 Depth (7-8 feet) (mg/kg)	Boring B-29 Depth (11-12 feet) (mg/kg)	Boring B-29 Depth (18-19 feet) (mg/kg)	Boring B-29 Depth (30-32 feet) (mg/kg)
Location: 10 Feet North of UST No. 287 (FACNO 10-287)					
Benzene	ND	ND	0.11	ND	ND
Toluene	ND	ND	ND	ND	ND
Ethyl benzene	ND	ND	ND	ND	ND
Xylenes	ND	ND	ND	ND	ND
1,1,1-trichloroethane	ND	ND	ND	ND	ND
cis-1,2-dichloroethene	ND	ND	ND	ND	ND
1,1-dichloroethane	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND
Trichloroethene	0.12	ND	ND	ND	ND

Table 3-11
Soil Samples Collected August – September 1985
From Borings B-28, B-29, and B-30 at UST No. 287 (FACNO 10-287) (Continued)

Chemical	Boring B-30 Depth (3-4 feet) (mg/kg)	Boring B-30 Depth (7-8 feet) (mg/kg)	Boring B-30 Depth (9-10 feet) (mg/kg)	Boring B-30 Depth (13-14 feet) (mg/kg)
Location: 10 Feet East of UST No. 287 (FACNO 10-287)				
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethyl benzene	ND	ND	ND	ND
Xylenes	ND	ND	ND	ND
1,1,1-trichloroethane	ND	ND	ND	ND
cis-1,2-dichloroethene	ND	ND	ND	ND
1,1-dichloroethane	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND

Key: ND = Not detected. Detection Limits = 0.01 - 0.1 mg/kg (dry weight).

limits as follows: oil and grease (2,860 to 12,500 mg/kg), methylene chloride (0.223 to 0.264 mg/kg), 1,1,1-trichloroethane (0.222 to 6.88 mg/kg), 1,1-dichloroethane (1.47 to 6.88 mg/kg), chloroethane (0.219 to 0.500 mg/kg), toluene (0.356 to 1.24 mg/kg), total xylenes (0.247 to 2.32 mg/kg), chloromethane (0.526 mg/kg), 1,1-dichloroethene (0.229 mg/kg), ethyl benzene (0.493 mg/kg), and Aroclor 1248 (0.892 to 3.85 mg/kg). On October 26, 1988, the side walls and bottom of the excavation pit were resampled. Five soil samples were collected and analyzed for oil and grease; one sample was analyzed for PCBs. Oil and grease was the only analyte detected at 282 mg/kg in one sample. Table 3-12 presents the sample collection dates, sample locations, analyses performed, and the analytical results (including detection limits) for samples collected from the excavation pit and pile (References 138, 286).

A RCRA Facility Investigation (RFI) at this tank site was recommended in the RCRA Facility Assessment (RFA) due to soil and groundwater contamination. The UST site requires further investigation under requirements of BUSTR and OEPA. UST No. 287 has been designated as Category 7.

3.2.9 UST Nos. 545 and 546 (FACNOs 10-545 and 10-546)

UST Nos. 545 and 546 (FACNOs 10-546 and 10-546) were installed in 1988 and were located northwest of Building 10. In March 1994, UST Nos. 545 and 546, which were located in underground vaults, were taken out of service. UST No. 545 had a capacity of 10,000 gallons and stored waste oil. UST No. 546 had a capacity of 3,000 gallons and stored trichoroethane.

A subsurface investigation of the soil in the vicinity of UST Nos. 545 and 546 was conducted in March 1994 (Reference 138). Two wipe samples were collected from the vaults, and six soil samples were collected from three soil borings installed in the vicinity of the tanks. The soil sample results indicated the presence of TPH and PAH constituents, but at levels below BUSTR action levels. The results of the wipe samples indicated the presence of TPH constituents at elevated levels on the concrete surface of the vault for UST No. 545. The investigation recommended that the vault be cleaned prior to its removal or demolition.

In October 1997, a preliminary inspection of UST Nos. 545 and 546 was performed as part of closure activities for these USTs. The vault for UST No. 545 was half full of water and the vault for UST No. 546 was completely full of water. Water samples were collected at three locations and analyzed at a laboratory. After reviewing the analytical results, the City of Columbus Division of Sewerage and Drainage authorized the discharge of the water; the water was pumped to the nearest sanitary sewer. Once both vaults and one tank were pumped dry, both USTs were removed in the presence of a certified City of Columbus Fire Inspector; a BUSTR removal report and permit were signed by the Inspector (Reference 276).

Two soil samples were collected from under the tank vaults. Each sample was analyzed for Toxicity Characteristic Leaching Procedure (TCLP) metals (Method 6010A), PCBs (Method 8081), Cyanide (Method 9010), Diesel Range Organics (Method 8015 MOD), PAHs (Method 8270B), Gasoline Range Organics (Method 8015 MOD), and VOCs (Method 8260A). One soil sample was collected under the vault for UST No. 545. The following were quantified above detection limits: barium (0.30 mg/L), diesel range organics (140 mg/kg), and methylene chloride (0.0029 mg/kg). One soil sample was collected under the vault for UST No. 546. The following were quantified above detection limits: barium (0.20 mg/L), diesel range organics (36 mg/kg),

Table 3-12
Samples collected during excavation of UST No. 287
(FACNO 10-287)

Tank Number	Sample Date	Sample Location	Matrix	Analyses
287	09/23/88	Water from excavation pit	Liquid	Analysis: PCBs Detection Limit(s): 0.5 mg/kg Results: Aroclor 1242 detected
287	09/23/88	Bottom of excavation pit	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: Oil & Grease (8500 mg/kg) Analysis: PCBs (Method 8080) Detection Limit(s): 0.5 mg/kg Results: Aroclor 1248 (1.67 mg/kg) Analysis: Volatile Organics (Method 8240) Detection Limit(s): 0.2 mg/kg Results: Chloroethane (0.219 mg/kg) 1,1-dichloroethane (2.14 mg/kg) 1,1,1-trichloroethane (1.29 mg/kg) Total xylenes (0.247 mg/kg)
287	09/23/88	East wall of excavation pit	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: Oil & Grease (8790 mg/kg) Analysis: PCBs (Method 8080) Detection Limit(s): 0.5 mg/kg Results: Aroclor 1248 (3.85 mg/kg) Analysis: Volatile Organics (Method 8240) Detection Limit(s): 0.2 mg/kg Results: 1,1-dichloroethane (1.47 mg/kg) Methylene chloride (0.264 mg/kg) 1,1,1-trichloroethane (0.414 mg/kg)
287	09/23/88	Excavation pile	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: Oil & Grease (8340 mg/kg) Analysis: PCBs (Method 8080) Detection Limit(s): 0.5 mg/kg Results: Aroclor 1248 (0.892 mg/kg) Analysis: Volatile Organics (Method 8240) Detection Limit(s): 0.2 mg/kg Results: Chloroethane (0.500 mg/kg) Chloromethane (0.526 mg/kg) 1,1-dichloroethane (6.88 mg/kg) 1,1-dichloroethene (0.229 mg/kg) Ethyl benzene (0.493 mg/kg) 1,1,1-trichloroethane (6.88 mg/kg)

Table 3-12
Samples collected during excavation of UST No. 287
(FACNO 10-287)

Tank Number	Sample Date	Sample Location	Matrix	Analyses
				Toluene (1.24 mg/kg) Total xylenes(2.32 mg/kg)
287	09/23/88	North wall of excavation pit	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: Oil & Grease (12500 mg/kg) Analysis: PCBs (Method 8080) Detection Limit(s): 0.5 mg/kg Results: BDL Analysis: Volatile Organics (Method 8240) Detection Limit(s): 0.2 mg/kg Results: Methylene chloride (0.236 mg/kg) 1,1,1-trichloroethane (0.222 mg/kg)
287	09/23/88	South wall of excavation pit	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: Oil & Grease (2860 mg/kg) Analysis: PCBs (Method 8080) Detection Limit(s): 0.5 mg/kg Results: BDL Analysis: Volatile Organics (Method 8240) Detection Limit(s): 0.2 mg/kg Results: 1,1,1-trichloroethane (0.462 mg/kg)
287	09/23/88	West wall of excavation pit	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: Oil & Grease (11200 mg/kg) Analysis: PCBs (Method 8080) Detection Limit(s): 0.5 mg/kg Results: BDL Analysis: Volatile Organics (Method 8240) Detection Limit(s): 0.2 mg/kg Results: Chloroethane (0.357 mg/kg) 1,1-dichloroethane (5.86 mg/kg) Methylene chloride (0.223 mg/kg) 1,1,1-trichloroethane (2.01 mg/kg) Toluene (0.356 mg/kg) Total xylenes (1.04 mg/kg)

Table 3-12
Samples collected during excavation of UST No. 287
(FACNO 10-287)

Tank Number	Sample Date	Sample Location	Matrix	Analyses
287	10/26/88	Bottom of excavation pit	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: BDL Analysis: PCBs (Method 8080) Detection Limit(s): 1.0 mg/kg Results: BDL
287	10/26/88	East wall of excavation pit	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: Oil & Grease (284 mg/kg)
287	10/26/88	North wall of excavation pit	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: BDL
/	10/26/88	South wall of excavation pit	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: BDL
287	10/26/88	West wall of excavation pit	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: BDL

Key:
ND - No data.
BDL - Below detection limit(s).
PCBs - Polychlorinated Biphenyls

dichlorodifluoromethane (0.0029 mg/kg), and methylene chloride (0.0059 mg/kg) (Reference 276).

The walls of both vaults were triple rinsed and wipe samples were collected from the walls of both vaults. Each sample was analyzed for Diesel Range Organics (Method 8015) and VOCs (Method 8260A). Only methylene chloride was detected at 15 µg in the wipe sample collected from the vault for UST No. 545. Based these analytical results, the vaults were considered clean and were filled with 302 stone. Both USTs were scrapped and the concrete vault covers were taken to a construction landfill for disposal.

Based on conversations with BUSTR, these USTs require additional investigation. These USTs are subject to requirements of both BUSTR and OEPA; these USTs have been designated as Category 7.

3.2.10 UST No. 97 (FACNO 21-97)

UST No. 97 (FACNO 21-97) was located under the southeast corner of Building 21. Constructed of steel, the tank had a capacity of 10,000 gallons and stored waste cutting oil. The UST was installed in 1941 and is now permanently inactive (the tank has been filled with concrete).

A sample of sludge was collected from UST No. 97 on September 3, 1987 and analyzed for oil and grease and PCBs. Oil and grease was detected at 255,000 mg/kg, and Aroclors 1248 and 1260 were detected at 2580 and 670 mg/kg, respectively. On September 18, 1987, a soil sample was collected in the vicinity of UST No. 97. Oil and grease was detected at 3340 mg/kg and Aroclor 1248 was detected at 2.35 mg/kg. On November 02, 1987, four borings were installed at UST No. 97 and one composite soil sample was collected from each boring; these samples were analyzed for halogenated VOCs and PCBs. Only trans-1,2-dichloroethene was detected in two of the samples at 2.43 and 2.70 mg/kg. Table 3-13 presents the sample collection dates, sample locations, analyses performed, and the analytical results (including detection limits) for samples collected at the UST (References 138, 286). In addition, samples from the excavation site contained 1,2-dichloroethane at concentrations that exceeded detection limits (Reference 138).

The UST site requires further investigation under requirements of BUSTR and OEPA. UST No. 97 has been designated as Category 7.

3.2.11 UST No. 90 (FACNO 49-90)

UST No. 90 (FACNO 49-90) was located west of Building 49. The UST was installed in 1954 and removed before December 22, 1988, the effective date of final federal Subtitle I regulations. Constructed of steel, the tank had a capacity of 10,000 gallons and stored aviation fuel.

In early May 1985, as part of an investigation of UST locations at AFP 85, 16 monitoring wells were installed at 16 UST locations; the monitoring wells were installed in the vicinity of the former USTs. As illustrated in Figure 3-1, one monitoring well (M-10) was installed at UST No. 90 (FACNO 49-90). On June 27-28, 1985, groundwater samples were collected from 14 monitoring wells; these samples and were analyzed for PHC and VOCs. As presented in Table

Table 3-13
Samples collected during excavation of UST No. 97
(FACNO 21-97)

Tank Number	Sample Date	Sample Location	Matrix	Analyses
97	09/03/87	Sludge from tank 97	Sludge	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 500 mg/kg Results: Oil & Grease (255000 mg/kg) Analysis: PCBs (Method 8080) Detection Limit(s): 1.0 mg/kg Results: Aroclor 1248 (2580 mg/kg) Aroclor 1260 (670 mg/kg)
97	09/18/87	Dirt from around tank 97	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): ND Results: Oil & Grease (3340 mg/kg) Analysis: PCBs (Method 8080) Detection Limit(s): 0.3 mg/kg Results: Aroclor 1248 (2.35 mg/kg)
	11/02/87	Boring No. 1	Soil (Composite)	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: trans-1,2-dichloroethene (2.43 mg/kg) Analysis: PCBs (Method 8080) Detection Limit(s): 1.0 mg/kg Results: BDL
97	11/02/87	Boring No. 2	Soil (Composite)	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: trans-1,2-dichloroethene (2.70 mg/kg) Analysis: PCBs (Method 8080) Detection Limit(s): 1.0 mg/kg Results: BDL
97	11/02/87	Boring No. 3	Soil (Composite)	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: BDL Analysis: PCBs (Method 8080) Detection Limit(s): 1.0 mg/kg Results: BDL
97	11/02/87	Boring No. 4	Soil (Composite)	Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1.0 mg/kg Results: BDL

Table 3-13
Samples collected during excavation of UST No. 97
(FACNO 21-97)

Tank Number	Sample Date	Sample Location	Matrix	Analyses
97	11/02/87	Boring No. 4	Soil (Composite)	Analysis: PCBs (Method 8080) Detection Limit(s): 1.0 mg/kg Results: BDL
97	08/09/88	3rd rinse of tank 97	Liquid	Analysis: PCBs (Method 608) Detection Limit(s): 5.0 ug/L Results: Aroclor 1248 (91.9 ug/L) Aroclor 1260 (22.5 ug/L)

Key:
ND - No data.
BDL - Below detection limit(s).
VOCs - Volatile Organic Compounds
PCBs - Polychlorinated Biphenyls

3-2, only PHC were detected at 2.5 mg/L in the groundwater sample collected from monitoring well M-10 (Reference 303).

The exact removal date for UST No. 90 is not known. Eight soil samples collected on August 19, 1987 from the side walls and bottom of the excavation pit were analyzed for oil and grease and aromatic VOCs. The following were quantified above detection limits: oil and grease (207 to 1230 mg/kg), benzene (1.53 mg/kg), and m-xylene (2.59 mg/kg). One additional sample, collected from an unknown location on an unknown sampling date, was analyzed for oil and grease, which was detected at 449 mg/kg. Table 3-14 presents the sample collection dates, sample locations, analyses performed, and the analytical results (including detection limits) for samples collected from the excavation pit (References 138, 286). In addition, samples from excavation stockpiles contained the following contaminants at concentrations that exceeded detection limits: benzene, xylenes, and oil and grease (Reference 138).

The UST site requires further investigation under requirements of BUSTR, and has been designated as Category 7.

3.2.12 UST Nos. 161, 162, 163, 164, 165, and 274 (FACNOs 124-161, 124-162, 124-163, 124-164, 124-165, and 124-274)

UST Nos. 161, 162, 163, 164, 165, and 274 (FACNOs 124-161, 124-162, 124-163, 124-164, 124-165, and 124-274) were located near the south side of Building 124. UST Nos. 161 through 165 were installed in 1954 and UST No. 274 was installed in 1959. All USTs were removed before December 22, 1988, the effective date of final federal Subtitle I regulations. The USTs were constructed of steel and stored JP-4 jet fuel. UST Nos. 161, 162, 163, and 164 each had a capacity of 2,000 gallons, UST No. 165 had a capacity of 10,000 gallons, and UST No. 274 had a capacity of 5,000 gallons.

In early May 1985, as part of an investigation of UST locations at AFP 85, 16 monitoring wells were installed at 16 UST locations; the monitoring wells were installed in the vicinity of the former USTs. As illustrated in Figure 3-1, one monitoring well (M-12) was installed at UST No. 161 (FACNO 124-161). On June 27-28, 1985, groundwater samples were collected from 14 monitoring wells; these samples were analyzed for PHC and VOCs. As presented in Table 3-2, only PHC were detected at 223 mg/L in the groundwater sample collected from monitoring well M-12 (Reference 303).

The exact removal dates for these USTs are not known. Six soil samples were collected on August 25, 1987 from the side walls and bottom of the excavation pit, and from the excavation pile, for these USTs. The samples were analyzed for oil and grease and aromatic VOCs. The following were quantified above detection limits: benzene (1.36 to 1.51 mg/kg), ethyl benzene (1.18 mg/kg), o-xylene (1.05 mg/kg), and m-xylene (1.38 to 3.82 mg/kg). Table 3-15 presents the sample collection dates, sample locations, analyses performed, and the analytical results (including detection limits) for samples collected from the excavation pit and pile (References 138, 242, 286).

In November 1996, as part of a sampling investigation conducted at AFP85 by the USGS, two soil samples were collected from one boring (No. USB20) advanced in the vicinity of UST Nos. 161-165 and 274. A soil sample was collected at 3.7-6.2 and 12.2-13.7 feet bgs at boring USB20. These samples were analyzed for volatiles (SW8240/SW8260), semivolatiles

Table 3-14
Samples collected during excavation of UST No. 90
(FACNO 49-90)

Tank Number	Sample Date	Sample Location	Matrix	Analyses
90	08/19/87	Bottom of excavation pit	Soil	Analysis: Aromatic VOCs (Method 602) Detection Limit(s): 1.0 mg/kg Results: BDL Analysis: Oil & Grease Detection Limit(s): 200 mg/kg Results: BDL
90	08/19/87	Bottom of excavation pit	Soil	Analysis: Unknown Detection Limit(s): ND Results: ND
90	08/19/87	East wall of excavation pit	Soil	Analysis: Aromatic VOCs (Method 602) Detection Limit(s): 1.0 mg/kg Results: BDL Analysis: Oil & Grease Detection Limit(s): 200 mg/kg Results: BDL
90	08/19/87	North excavation pile	Soil	Analysis: Aromatic VOCs (Method 602) Detection Limit(s): 1.0 mg/kg Results: Benzene (1.53 mg/kg) Analysis: Oil & Grease Detection Limit(s): 200 mg/kg Results: Oil & Grease (393 mg/kg)
90	08/19/87	North wall of excavation pit	Soil	Analysis: Aromatic VOCs (Method 602) Detection Limit(s): 1.0 mg/kg Results: BDL Analysis: Oil & Grease Detection Limit(s): 200 mg/kg Results: Oil & Grease (207 mg/kg)
90	08/19/87	South wall of excavation pit	Soil	Analysis: Aromatic VOCs (Method 602) Detection Limit(s): 1.0 mg/kg Results: BDL Analysis: Oil & Grease Detection Limit(s): 200 mg/kg Results: Oil & Grease (1230 mg/kg)

Table 3-14
Samples collected during excavation of UST No. 90
(FACNO 49-90)

Tank Number	Sample Date	Sample Location	Matrix	Analyses	
90	08/19/87	West excavation pile	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg m-xylene (2.59 mg/kg)
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL
90	08/19/87	West wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL
90		Unknown	Solid	Analysis: Detection Limit(s): Results:	Oil & Grease 250 mg/kg Oil & Grease (449 mg/kg) **

Key:

** - The laboratory analytical report for this data was not identified during the records search for this Work Plan. The data is based on a handwritten O.H. Materials Corporation laboratory data sheet.

ND - No data.

BDL - Below detection limit(s).

VOCs - Volatile Organic Compounds

Table 3-15
Samples collected during excavation of UST Nos. 161,162,163,164,165, and 274
(FACNOs 124-161, 124-162, 124-163, 124-164, 124-165, and 124-274)

Tank Number	Sample Date	Sample Location	Matrix	Analyses	
161,162,163, 164,165,274	08/25/87	Bottom of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg Benzene (1.51 mg/kg)
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL
161,162,163, 164,165,274	08/25/87	East wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL
161,162,163, ',165,274	08/25/87	Excavation soil	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg Benzene (1.38 mg/kg) m-xylene (1.38 mg/kg)
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL
161,162,163, 164,165,274	08/25/87	North wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg Ethyl benzene (1.18 mg/kg) m-xylene (3.82 mg/kg) o-xylene (1.05 mg/kg)
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL
161,162,163, 164,165,274	08/25/87	South wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL

Table 3-15
Samples collected during excavation of UST Nos. 161,162,163,164,165, and 274
(FACNOs 124-161, 124-162, 124-163, 124-164, 124-165, and 124-274)

Tank Number	Sample Date	Sample Location	Matrix		Analyses
161,162,163, 164,165,274	08/25/87	West wall of excavation pit	Soil	Analysis:	Aromatic VOCs (Method 602)
				Detection Limit(s):	1.0 mg/kg
				Results:	Benzene (1.36 mg/kg)
				Analysis:	Oil & Grease
				Detection Limit(s):	200 mg/kg
				Results:	BDL
161,162,163, 164,165,274	08/25/87	Water sample from excavation pit	Water	Analysis:	Unknown
				Detection Limit(s):	ND
				Results:	ND

Key:
ND - No data.
BDL - Below detection limit(s).
VOCs - Volatile Organic Compounds.

(SW8270), and pesticides/PCBs (SW8080). Only acetone (0.14 J mg/kg) was detected in the sample collected at 3.7-6.2 feet bgs. No analytes were quantified above detection limits in the sample collected from 12.2-13.7 feet bgs (Reference 278).

UST Nos. 161, 162, 164, 165, and 274 require further investigation under requirements of BUSTR and have been designated as Category 7.

3.2.13 UST No. 166 (FACNO 125-166)

UST No. 166 (FACNO 125-166) was located near the south side Building 125. The UST was installed in 1956 and removed before December 22, 1988, the effective date of final federal Subtitle I regulations. Constructed of steel, the tank had a capacity of 10,000 gallons and stored waste oil. (Reference 138).

In early May 1985, as part of an investigation of UST locations at AFP 85, 16 monitoring wells were installed at 16 UST locations; the monitoring wells were installed in the vicinity of the former USTs. As illustrated in Figure 3-1, one monitoring well (M-14) was installed at UST No. 166 (FACNO 125-166). On June 27-28, 1985, groundwater samples were collected from 14 monitoring wells; these samples were analyzed for PHC and VOCs. As presented in Table 3-2, only PHC were detected at 13 mg/L in the groundwater sample collected from monitoring well M-14 (Reference 303).

The exact removal date for UST No. 166 is not known. Six soil samples were collected on October 21, 1988 from the side walls and bottom of the excavation pit, and from the excavation pile, for UST No. 166. These samples were analyzed for oil and grease, which was not quantified above the detection limit of 200 mg/kg. One solid sample was collected from drums associated with UST No. 166; it is unclear if the drums contained excavated material or the former contents of the tank. The solid sample was analyzed for aromatic and halogenated VOCs, PCBs, RCRA metals (by EP Toxicity Leachate), total cyanide, and total PHC. The following were quantified above detection limits: toluene (324,000 µg/kg), ethyl benzene (4,200 µg/kg), total xylenes (13,600 µg/kg), methylene chloride (8,150 µg/kg), tetrachlorethene (2,210 µg/kg), Aroclor 1260 (3.04 mg/kg), barium (0.26 mg/L), and total PHC (438,000 mg/kg). Table 3-16 presents the sample collection dates, sample locations, analyses performed, and the analytical results (including detection limits) for samples collected from the excavation pit, pile, and associated drums (Reference 286).

In November 1996, as part of a sampling investigation conducted at AFP85 by the USGS, two soil samples were collected from one boring (No. USB04) advanced in the vicinity of UST No. 166. A soil sample was collected at 8.5-11.0 and 33.5-36.0 feet bgs at boring USB04. These samples were analyzed for volatiles (SW8240/SW8260), semivolatiles (SW8270), and pesticides/PCBs (SW8080). No analytes were quantified above detection limits in the sample collected from 8.5-11.0 feet bgs. Acetone (0.013 J mg/kg) and heptachlor epoxide (0.057 mg/kg) were detected in the sample collected at 33.5-36.0 feet bgs (Reference 278).

Because the soil sample that was analyzed for PCBs was collected between 8.5 to 11.0 bgs which is above the bottom of the former UST at 10.6 bgs, and because no groundwater samples were analyzed for PCBs, UST No. 166 requires further investigation under requirements of BUSTR and OEPA. UST No. 166 has been designated as Category 7.

Table 3-16
Samples collected during excavation of UST No. 166
(FACNO 125-166)

Tank Number	Sample Date	Sample Location	Matrix	Analyses
166	10/21/88	Bottom of excavation pit	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: BDL
166	10/21/88	East wall of excavation pit	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: BDL
166	10/21/88	Excavation pile	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: BDL
166	10/21/88	North wall of excavation pit	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: BDL
166	10/21/88	South wall of excavation pit	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: BDL
166	10/21/88	West wall of excavation pit	Soil	Analysis: Oil & Grease (Method 503D) Detection Limit(s): 200 mg/kg Results: BDL
166	11/10/88	Drums 4604-(15,16,17,18) from tank 166	Solid	Analysis: Sulfide Detection Limit(s): ND Results: Sulfide (178 mg/kg)
166	11/10/88	Drums 4604-(75,76,77,78) from tank 166	Solid	Analysis: Aromatic VOCs (Method 8020) Detection Limit(s): 1,000 ug/kg Results: Toluene (324000 ug/kg) Ethyl benzene (4200 ug/kg) Total xylenes (13600 ug/kg) Analysis: Halogenated VOCs (Method 8010) Detection Limit(s): 1,000 ug/kg Results: Methylene chloride (8150 ug/kg) Tetrachloroethene (2210 ug/kg)

Table 3-16
Samples collected during excavation of UST No. 166
(FACNO 125-166)

Tank Number	Sample Date	Sample Location	Matrix	Analyses	
166	11/10/88	Drums 4604-(75,76,77,78) from tank 166	Solid	Analysis:	PCBs (Method 8080)
				Detection Limit(s):	0.5 mg/kg
				Results:	Aroclor 1260 (3.04 mg.kg)
				Analysis:	RCRA Metals (EP Tox Leachate)
				Detection Limit(s):	(Method 6010)
				Results:	0.1 mg/L (Hg 0.05)
					Barium (0.26 mg/L)
				Analysis:	Total Cyanide (Method 9010)
				Detection Limit(s):	1.0 mg/kg
				Results:	Total cyanide (< 1.0 mg/kg)
				Analysis:	Total PHC by IR (Method 418.1)
				Detection Limit(s):	50 mg/kg
				Results:	Total PHC (438000 mg/kg)

Key:
ND - No data.
BDL - Below detection limit(s).
VOCs - Volatile Organic Compounds.

3.2.14 UST Nos. 109, 110, 111, and 215 (FACNOs 141-109, 141-110, 141-111, and 141-215)

UST Nos. 109, 110, 111, and 215 (FACNOs 141-109, 141-110, 141-111, and 141-215) were located west of Building 141. UST No. 215 was installed in 1953 and UST Nos. 109, 110, and 111 were installed in 1956. These USTs were removed before December 22, 1988, the effective date of final federal Subtitle I regulations. Constructed of steel, each tank had a capacity of 15,000 gallons and stored JP-5 jet fuel (Reference 138).

In early May 1985, as part of an investigation of UST locations at AFP 85, 16 monitoring wells were installed at 16 UST locations; the monitoring wells were installed in the vicinity of the former USTs. As illustrated in Figure 3-1, one monitoring well (M-9) was installed west of UST Nos. 109, 110, 111, and 215 (FACNOs 141-109, 141-110, 141-111, and 141-215). On June 27-28, 1985, groundwater samples were collected from 14 monitoring wells; however, a sample could not be collected from monitoring well M-9 because the well was dry at the time of sampling (Reference 303).

The exact removal dates for UST Nos. 109, 110, 111, and 215 are not known. Five soil samples were collected on December 9, 1988 from the side walls and bottom of the excavation pit for these USTs. These samples were analyzed for oil and grease and non-halogenated VOCs. Only oil and grease was detected at concentrations ranging from 175 to 2,200 mg/kg. In addition to these samples, one soil sample that was collected from a "clean" excavation pile was analyzed for oil and grease and non-halogenated VOCs, and one soil sample that was collected from a "dirty" excavation pile was analyzed for oil and grease, aromatic and non-halogenated VOCs, ketones, PCBs, RCRA metals, SVOCs, total cyanide, total PHC, total phenols, and total sulfide. Table 3-17 presents the sample collection dates, sample locations, analyses performed, and the analytical results (including detection limits) for samples collected from the excavation pit and piles (References 138, 286).

UST Nos. 109, 110, 111, and 215 require further investigation under requirements of BUSTR; these USTs have been designated as Category 7.

3.2.15 UST No. 297 (FACNO 141-297)

UST No. 297 (FACNO 141-297) was located north of Building 141. The UST was installed in 1968 and removed before December 22, 1988, the effective date of final federal Subtitle I regulations. Constructed of steel, the tank had a capacity of 1,500 gallons and stored JP-4 jet fuel.

In early May 1985, as part of an investigation of UST locations at AFP 85, 16 monitoring wells were installed at 16 UST locations; the monitoring wells were installed in the vicinity of the former USTs. As illustrated in Figure 3-1, one monitoring well (M-19) was installed at UST No. 297 (FACNO 141-297). On June 27-28, 1985, groundwater samples were collected from 14 monitoring wells; these samples were analyzed for PHC and VOCs. As presented in Table 3-2, no constituents were quantified above detection limits for the groundwater samples collected from monitoring well M-19.

The exact removal date for UST No. 297 is not known. Five soil samples were collected on August 19, 1987 from the side walls and bottom of the excavation pit; these samples were analyzed for oil and grease and aromatic VOCs. Only oil and grease was detected at 3,310

Table 3-17
Samples collected during excavation of UST Nos. 109, 110, 111, and 215
(FACNOs 141-109, 141-110, 141-111, and 141-215)

Tank Number	Sample Date	Sample Location	Matrix	Analyses	
109,110,111, 215	12/09/88	Bottom of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Nonhalogenated VOCs (Method 8015) 0.5 mg/L BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease (Method 503D) 200 mg/kg Oil & Grease (175 mg/kg)
109,110,111, 215	12/09/88	Clean pile excavation	Soil	Analysis: Detection Limit(s): Results:	Nonhalogenated VOCs (Method 8015) 0.5 mg/L BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease (Method 503D) 200 mg/kg Oil & Grease (395 mg/kg)
109,110,111, 5	12/09/88	Dirty pile excavation	Soil	Analysis: Detection Limit(s): Results:	Nonhalogenated VOCs (Method 8015) 0.5 mg/L BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease (Method 503D) 200 mg/kg Oil & Grease (1150 mg/kg)
109,110,111, 215	12/09/88	East wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Nonhalogenated VOCs (Method 8015) 0.5 mg/L BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease (Method 503D) 200 mg/kg Oil & Grease (2200 mg/kg)
109,110,111, 215	12/09/88	North wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Nonhalogenated VOCs (Method 8015) 0.5 mg/L BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease (Method 503D) 200 mg/kg Oil & Grease (325 mg/kg)

Table 3-17
Samples collected during excavation of UST Nos. 109, 110, 111, and 215
(FACNOs 141-109, 141-110, 141-111, and 141-215)

Tank Number	Sample Date	Sample Location	Matrix		Analyses
109,110,111, 215	12/09/88	South wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Nonhalogenated VOCs (Method 8015) 0.5 mg/L BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease (Method 503D) 200 mg/kg Oil & Grease (265 mg/kg)
109,110,111, 215	12/09/88	West wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Nonhalogenated VOCs (Method 8015) 0.5 mg/L BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease (Method 503D) 200 mg/kg Oil & Grease (250 mg/kg)
109,110,111, 5	12/14/88	Dirty pile	Solid	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 8020) 0.01 - 0.002 mg/L Toluene (0.002 mg/L)
				Analysis: Detection Limit(s): Results:	Ketones (TCLP)(Method 8090) 0.5 - 1.0 mg/L BDL
				Analysis: Detection Limit(s): Results:	PCBs (Method 8080) 0.5 mg/kg BDL
				Analysis: Detection Limit(s): Results:	RCRA Metals (EP Toxicity)(Method 6010) 0.1 mg/L Barium (0.26 mg/L)
				Analysis: Detection Limit(s): Results:	Semi-volalites (TCLP)(Method 8270) 0.01 mg/L BDL
				Analysis: Detection Limit(s): Results:	Total Cyanide (Method 9010) ND Total cyanide (< 1.0 mg/kg)
				Analysis: Detection Limit(s): Results:	Total PHC by IR (Method 418.1) 50 mg/kg Total PHC (126 mg/kg)

Table 3-17
Samples collected during excavation of UST Nos. 109, 110, 111, and 215
(FACNOs 141-109, 141-110, 141-111, and 141-215)

Tank Number	Sample Date	Sample Location	Matrix	Analyses	
109,110,111, 215	12/14/88	Dirty pile	Solid	Analysis:	Total Phenols (Method 9065)
				Detection Limit(s):	ND
				Results:	Total Phenols (3.64 mg/kg)
				Analysis:	Total Sulfide
				Detection Limit(s):	ND
				Results:	Total Sulfide (< 10 mg/kg)

Key:

ND - No data.
BDL - Below detection limit(s)
VOCs - Volatile Organic Compounds.
PCBs - Polychlorinated Biphenyls.
PHC - Petroleum Hydrocarbons

mg/kg in the sample collected from the east wall of the excavation pit. Two soil samples were also collected from two excavation piles; these samples were also analyzed for oil and grease and aromatic VOCs. Only oil and grease was detected at 255 mg/kg. Table 3-18 presents the sample collection dates, sample locations, analyses performed, and the analytical results (including detection limits) for samples collected from the excavation pit and piles (References 138, 286).

UST No. 297 requires further investigation under requirements of BUSTR, and has been designated as Category 7.

3.2.16 UST Nos. 239, 240 and 243 (FACNOs 214-239, 214-240, and 214-243)

UST Nos. 239, 240 and 243 (FACNOs 214-239, 214-240, and 214-243) were located on the south side of Building 214. The USTs were installed in 1957 and removed before December 22, 1988, the effective date of final federal Subtitle I regulations. Constructed of steel, UST Nos. 239 and 240 each had a capacity of 10,000 gallons and stored JP-4 jet fuel. UST No. 243, which had a capacity of 5,000 gallons and stored waste JP-4 and JP-5, was an interim status RCRA unit that has been granted clean closure by OEPA (Reference 241); this UST will not be discussed further in the section. UST Nos. 239 and 240 are subject to the requirements of BUSTR.

The exact removal dates for UST Nos. 239 and 240 are not known. Seven soil samples were collected on August 25, 1987 from the side walls and bottom of excavation pit, and from excavated soils, for UST Nos. 239 and 240. These samples were analyzed for oil and grease and aromatic VOCs. Oil and grease, benzene, m-xylene, and o-xylene were quantified above detection limits. One solid sample was collected from an unknown location on an unknown sampling date. This sample was analyzed for oil and grease which was not quantified above the detection limit of 250 mg/kg. Table 3-19 presents the sample collection dates, sample locations, analyses performed, and the analytical results (including detection limits) for samples collected from the excavation pit and excavated soils for UST Nos. 239 and 240 (References 138, 286).

UST Nos. 239 and 240 require further investigation under requirements of BUSTR, and have been designated as Category 7.

3.2.17 UST No. 96 (FACNO 404-96)

UST No. 96 (FACNO 404-96) was located near the west side of Building 404. The tank was in place from approximately 1938 to 1993. Constructed of steel, the tank had a capacity of 15,000 gallons and stored lubricating oil. In June 1993, the UST was pumped, pressure washed, filled with concrete, and left in place.

Five soil borings were installed around the perimeter of the UST; each boring was installed to a depth of approximately 14 feet bgs. Soil samples collected from the five borings contained the following contaminants and maximum concentrations: benzene (3 µg/kg), toluene (24 µg/kg), ethyl benzene (2 µg/kg), o-xylene (8 µg/kg), and TPH (40 mg/kg). These sample concentrations were below BUSTR action levels (References 127, 244). Based on field observations and laboratory analyses, it appears that this UST has not adversely impacted surrounding soils (Reference 127). However, BUSTR stated that residual contamination remains above action

Table 3-18
Samples collected during excavation of UST No. 297
(FACNO 141-297)

Tank Number	Sample Date	Sample Location	Matrix	Analyses	
297	08/19/87	Bottom of excavation pit	Liquid	Analysis: Detection Limit(s): Results:	Unknown ND ND
297	08/19/87	Bottom of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL
297	08/19/87	East wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg Oil & Grease (3310 mg/kg)
297	08/19/87	North excavation pile	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL
297	08/19/87	North wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL
297	08/19/87	South excavation pile	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg Oil & Grease (255 mg/kg)

Table 3-18
Samples collected during excavation of UST No. 297
(FACNO 141-297)

Tank Number	Sample Date	Sample Location	Matrix	Analyses	
297	08/19/87	South wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL
297	08/19/87	West wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL
297		Unknown	Solid	Analysis: Detection Limit(s): Results:	Oil & Grease 250 mg/kg BDL

Key:
ND - No data.
BDL - Below detection limit(s).
VOCs - Volatile Organic Compounds

Table 3-19
Samples collected during excavation of UST Nos. 239 and 240
(FACNOs 214-239 and 214-240)

Tank Number	Sample Date	Sample Location	Matrix	Analyses	
239,240	08/25/87	Bottom of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg m-xylene (1.04 mg/kg)
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL
239,240	08/25/87	East wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg Oil & Grease (479 mg/kg)
239,240	08/25/87	Excavated soil	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg o-xylene (1.30 mg/kg)
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL
239,240	08/25/87	Excavated soil	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg Oil & Grease (483 mg/kg)
239,240	08/25/87	North wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg Benzene (1.53 mg/kg)
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL
239,240	08/25/87	South wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg Benzene (1.49 mg/kg)

Table 3-19
Samples collected during excavation of UST Nos. 239 and 240
(FACNOs 214-239 and 214-240)

Tank Number	Sample Date	Sample Location	Matrix	Analyses	
239,240	08/25/87	South wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL
239,240	08/25/87	West wall of excavation pit	Soil	Analysis: Detection Limit(s): Results:	Aromatic VOCs (Method 602) 1.0 mg/kg BDL
				Analysis: Detection Limit(s): Results:	Oil & Grease 200 mg/kg BDL
239,240		Unknown	Solid	Analysis: Detection Limit(s): Results:	Oil & Grease 250 mg/kg BDL

Key:
ND - No data.
BDL - Below detection limit(s).
VOCs - Volatile Organic Componds.

levels and that this UST site requires further investigation and sampling for lubricating oil constituents (Reference 44). UST No. 96 has been designated as Category 7.

3.3 PCB Sites

In the EBS Addendum for AFP 85 dated December 1997 (Reference 267), 11 PCB-contaminated sites were identified as requiring further investigation and/or remediation. Since that time, several sites have been completely or partially remediated in accordance with TSCA regulations. Completely remediated sites include:

- East Bliss Press (FACNO 3-SMPFAB4)
- T-Pit (FACNO 3-SMPFAB2)
- IRP Site 3 - PCB Spill Site (FACNO IRP-3), and
- Transformer Vault 72 (FACNO 3-TV72).

Partially remediated sites include:

- Substation 27 (FACNO 125-SUB27),
- Substation 34 (FACNO 3-SUB34),
- Transformer Vault 17 (FACNO 7-TV17), and
- Transformer Vault 18 (FACNO 7-TV18).

Sites at which no further work has been conducted include:

- Master Substation 1 (FACNO 11-MS1),
- Substation 11A (FACNO 11-SUB11A), and
- Master Substation 2 (FACNO 271-MS2).

Historical release information and remediation activities at the East Bliss Press and T-pit were discussed in the SOW for eligible sites dated April 1998 (Reference 308). Remediation activities at each of the remaining sites are discussed in the following subsections.

3.3.1 IRP Site 3 - PCB Spill Site (FACNO IRP-3)

In January 1983, transformer oil containing PCBs was spilled at this site. The spill occurred adjacent to an electrical substation referred to as Electrical Substation 23. Soils at the site were excavated twice by plant personnel. On the first occasion, an area 3-feet wide, 12-feet long, and 3-inches deep was excavated. The excavated soil was treated as hazardous waste and disposed offsite. The second excavation expanded the area of the previous excavation by an additional 2 feet in width and 6-inches in depth (Reference 109). This site has been designated as Category 5.

From 1986 to 1988, soil samples were collected during the installation of 15 soil borings. The only PCB detected at the site was Aroclor-1260. The Aroclor-1260 concentrations in the soil samples ranged from 0.06 to 700 ppm. Based on these concentrations, the USAF selected a cleanup objective of 25 ppm for the PCBs in the soil in accordance with TSCA (Reference 109).

In December 1991, as part of additional investigations at this site, a test pit was excavated and a total of thirteen soil samples were collected and analyzed for Organochlorine Pesticides/PCBs. Analytical results showed Aroclor-1260 concentrations in six of the thirteen samples above the 25 ppm cleanup objective, with concentrations ranging from 0.39 to 2,500

ppm. Another test pit was excavated in September 1992, and 15 soil samples were collected. The samples were analyzed for PCBs, and the results indicated that concentrations of PCBs were below the 25 ppm cleanup objective. Three wipe samples and a concrete composite sample were also collected from a concrete pad located at the site and analyzed for PCBs. Two of the three wipe samples had concentrations which exceeded the 100 µg/100 cm^2 cleanup objective outlined in TSCA for low-contact outdoor surfaces in restricted access areas (Reference 109).

To facilitate sampling, the concrete pad was removed and samples of gravel fill material located beneath the concrete pad were collected. Analytical results for the gravel fill material indicated that concentrations of PCBs exceeded the 25 ppm cleanup objective. Soil and concrete removed during the excavation of test pits were disposed of at a permitted treatment, storage, and disposal facility (TSDF) (Chemical Waste Management in Model City, New York) (Reference 109).

A baseline risk assessment was performed using the available analytical data for the site. The average risks were determined to be below the risk range specified as the Superfund Site Remediation Goal as presented in the National Contingency Plan (300 CFR). However, the concentration and extent of PCBs in the gravel fill material below the concrete pad was not fully characterized (Reference 109).

The USAF contracted to remove PCB-impacted soils from the site. Soil remediation was conducted in June 1994, July 1995, May 1996, and December 1997 as described below (Reference 250 and 280).

June 1994 Remedial Effort. Approximately 43.6 tons of concrete, soil, and gravel fill material were removed from the site, resulting in an excavation approximately 19-feet by 30-feet by 3- to 5-feet deep. Ten soil samples were collected from the excavation; six from the bottom of the excavation and one soil sample from each sidewall. The samples were analyzed for PCBs. The results of the soil analyses indicated Aroclor 1260 ranged from non-detect to 843 ppm in a soil sample obtained from the bottom of the excavation (Reference 212). The results of the June 1994 effort indicated additional remediation was required (Reference 250).

July 1995 Remedial Effort. On the first day of PCB-impacted soil excavation, approximately 80 cubic yards of soil were removed. PCB field screening of soils indicated that significant concentrations of PCBs were still present in the soils of the excavation. On the second day of removal activity, after removing approximately three buckets of soil from the excavation, sand fill around a buried line was uncovered and a large quantity of water flowed into the excavation. Remedial activities were terminated due to the water accumulation. Seven soil samples were collected from the western end of the excavation. The samples were analyzed for PCBs (Method SW846/8080). All seven soil samples had non-detectable levels of PCBs (Reference 250).

May 1996 Remedial Effort. Approximately 55 cubic yards of PCB-impacted soil were removed form the northeast and southeast portions of the excavation. Field testing of soils was conducted using PCB immunoassay kits. Soil samples were collected from the excavation for the purpose of verifying the corrective action. The excavation was sampled in accordance with OEPA and Federal PCB sampling guidance. Nine composite samples and one grab soil sample were collected from the southeast excavation. One composite sample was collected from the northeast portion of the excavation. The samples were analyzed for PCBs (Method SW-

846/8081). Concentrations of the PCB Aroclor 1260 ranged from 0.1157 to 33.67 ppm. Three samples exceeded the site corrective action level, which at the time was set at the residential cleanup level of 10 ppm (Reference 250).

December 1997 Remedial Effort. The final remedial effort was conducted by Kelchner Environmental in December 1997 (Reference 280). Kelchner completed the following tasks:

- Dewatering of the existing excavation,
- Initial soil excavation and stockpiling ,
- Soil sampling and laboratory analysis,
- PCB wipe sampling and laboratory analysis,
- Surface water and groundwater sampling and laboratory analysis,
- Water treatment and disposal,
- Soil disposal, and
- Site restoration (backfilling and seeding).

Water from the excavation was pumped into two tanker trucks. One tanker truck (Tanker 1) was filled to capacity (21,000 gallons) with excavation water and the other (Tanker 2) was filled with 4,310 gallons of excavation water. Analysis of water samples from each truck indicated total PCB concentrations of less than 1 µg/L in Tanker 1 and 1.2 µg/L in Tanker 2. Excavation water in Tanker 2 was treated with an activated charcoal filter until the total PCB concentration was less than 1 µg/L. Water from both tanker trucks was then discharged to the sanitary sewer system in accordance with an agreement with the City of Columbus that set a discharge limit of 1 µg/L total PCBs.

Soil was removed from the site until the industrial soil cleanup goal (25 mg/kg) was achieved. Concrete conduits at the site were cleaned until the industrial wipe sample cleanup goal was met (100 µg/100cm^2). A report detailing the remediation activities (Reference 280) was submitted to OEPA, who concurred with the report, effectively granting clean closure (Reference 282).

3.3.2 Transformer Vault 72 (FACNO 3-TV72)

This transformer vault is located near column F29 in the center of Building 3. It houses transformer P72. This transformer has leaked at the temperature gauge, potheads, gasket, and selector switch. Concentrations of PCBs in oil were as high as 770,000 ppm and 30,000 µg/100 cm^2 on surfaces (Refs. 178, 179).

Transformer vault 72 was cleaned between January 17 and March 13, 1997. The concrete floor that was cleaned measured approximately 16 square feet (ft^2). Six rounds of sampling were conducted, with the analytical results of the last round all showing PCB concentrations below the TSCA limit of 100 µg/100 cm^2. In accordance with TSCA regulations for cleanup of industrial sites, the concrete surface was then sealed. One coat of epoxy sealer was applied, followed by two coats of gray sealer. A report detailing the remediation activities (Reference 270) was submitted to OEPA, which approved the report (Reference 327).

The cleanup goal for industrial sites (100 µg/100 cm^2 plus encapsulation) promulgated under TSCA (40 CFR 761.125) has been met at this site. No further investigation of this site is planned.

3.3.3 Substation 27 (FACNO 125-SUB27)

This substation is located near column A10 in the east-central section of Building 125. It houses transformer P27, which was leaky at one of the switches (Reference 179). Initial cleaning efforts did not reduce PCB concentrations to below TSCA action levels (Reference 168).

Further cleanup efforts were conducted between March 18 and July 3, 1997 on an area of concrete floor measuring approximately 297 ft^2. Analytical results from the final round of sampling yielded PCB concentrations ranging from 12 to 95 µg/100cm^2. In accordance with TSCA regulations for cleanup of industrial sites, the concrete surface was then sealed. One coat of epoxy sealer was applied, followed by two coats of gray sealer. A report detailing the remediation activities (Reference 270) was submitted to OEPA, which approved the report (Reference 327), but noted that the drain at this location required further investigation.

The cleanup goal for industrial sites (100 µg/100 cm^2 plus encapsulation) promulgated under the TSCA (40 CFR 761.125) has been met at this site. The site is considered closed except for the drain area, which will be investigated or subject to site inspection by the PCB Unit of OEPA.

3.3.4 Substation 34 (FACNO 3-SUB34)

This substation is located outside near the southeast corner of Building 3. Analytical results from a wipe sample collected from the drain contained PCBs at concentrations as high as 14,000 µg/100 cm^2.

After sealing the drain, remediation activities on the vault were conducted through May 1997. Confirmatory samples contained PCB concentrations below the TSCA limit of 100 µg/100 cm^2, with concentrations ranging from 5.1 to 45 µg/100 cm^2 (Reference 270). In accordance with TSCA regulations for cleanup of industrial (i.e., restricted access) sites, the concrete surface was then sealed. One coat of epoxy sealer was applied, followed by two coats of gray sealer. A report detailing the remediation activities (Reference 270) was submitted to OEPA. OEPA approved the report (Reference 327), but noted that the drain at this location required further investigation.

3.3.5 Transformer Vault 17 (FACNO 7-TV17)

This transformer vault is located near column A31 in the south-central section of Building 7. It houses transformers L17 and P17. Transformer L17 was leaky at the sight gauge, and transformer P17 is leaky under the fins and at the drain (References 172, 189). Post cleanup samples from initial remediation efforts contained PCBs at concentrations ranging from 2.7 to 3,000 µg/100 cm^2 (Reference 168).

After sealing the drain, remediation activities on the 860 ft^2 concrete vault floor were conducted between March 18 and July 18, 1997. Analytical results from the final round of sampling yielded PCB concentrations ranging from 2.7 to 97 µg/100cm^2, below the TSCA limit of 100 µg/100 cm^2. In accordance with TSCA regulations for cleanup of industrial sites, the concrete surface was then sealed. One coat of epoxy sealer was applied, followed by two coats of gray sealer. A report detailing the remediation activities (Reference 270) was submitted to OEPA. OEPA approved the report (Reference 327), but noted that the drain at this location required further investigation.

3.3.6 Transformer Vault 18 (7-TV18)

This transformer vault is located near column A16 in the southwest section of Building 7. The vault houses transformers L18 and P56. Transformer L18 was leaky at the sight gauge drain, and transformer P56 was leaky at the potheads, the gasket between the tran and oil switch and the selector switch (References 172, 189). Initial cleaning reduced concentrations to between 38 and 2,400 µg/100 cm^2 (Reference 168).

After sealing the drain, remediation activities on the 860 ft^2 concrete vault floor were conducted between March 7 and August 8, 1997. Analytical results from the final round of sampling yielded PCB concentrations ranging from 3.9 to 78 µg/100cm^2, below the TSCA limit of 100 µg/100 cm^2. In accordance with TSCA regulations for cleanup of industrial sites, the concrete surface was then sealed. One coat of epoxy sealer was applied, followed by two coats of gray sealer. A report detailing the remediation activities (Reference 270) was submitted to OEPA. OEPA approved the report (Reference 327), but noted that the drain at this location required further investigation.

3.3.7 Master Substation 1 (FACNO 11-MS1)

Master substation 1 is located in a fenced area north of Building 11, which is to the southwest of Building 3. It contains the following transformers: P1, P2, P3, P4, P5, P6, P7, P11, P11A, 40-13PT-A, 40-13PT-B, 40-13PT-C, 40-14PT-C, 40-14PT-A, 40-14PT-B, and 40-14PT-C (Reference 213). Areas of known leaks are summarized below in Table 3-20.

Table 3-20
Leaks at Transformers within MS-1

Transformer	Location of Leak	Status	Reference
P1	Secondary bushings	Repaired by the Army Corps of Engineers; area never investigated for PCBs.	189, 310
P4	Drain on holding tank, expansion valves	Never investigated.	189, 310
P7	Secondary bushings, switches, cutouts	Wipe sample in 1994 yielded Aroclor 1260 concentration of 11,000 µg/100 cm^2. Transformer removed; visible staining remains on edge of concrete pad and on 2' x 2' area of gravel	179, 189, 310
40-13OCB	Oil switches at oil circuit breaker	Replaced with dry-type transformer; area never investigated	189, 310
40-14OCB	Oil switches at oil circuit breaker	Replaced with dry-type transformer; area never investigated.	189, 310

According to the 1994 PCB Annual Report for AFP 85 (Reference 173), transformers P1 and P7 do not currently contain PCB fluids, and fluid at P4 is only PCB-contaminated (i.e., 50-500 ppm PCB). The report also indicates that all of the oil circuit breakers (OCBs) contain less than 10 ppm PCBs. However, it is not known whether PCB-containing fluids had been used historically at these transformers. Therefore, concrete surfaces and soil may be contaminated with PCBs. The areas above require further investigation under TSCA.

3.3.8 Substation 11A (FACNO 11-SUB11A)

Substation 11A is located just north of master substation 1, which is north of Building 11. It contains transformers P1-1, P6, P8, and P74 (References 177, 181). Transformer P74 is the only transformer where leakage was documented. In October 1994, PCBs were detected on the concrete pad east of transformer P74 at a concentration of 210 µg/100 cm^2 (Reference 179). In 1995, approximately 1 cubic yard of soil and gravel was excavated from a stained area north and east of the substation. Concentrations of PCBs in closure samples from the excavation floor and sidewall were below detection limits for PCBs (0.033 mg/kg). A trip layer of poly sheeting was used to line the excavated area, and clean pea gravel was used to backfill the hole (Reference 168). Leaks were reported after this remedial effort (References 180, 182), specifically at the gauge, panel, secondary bushings, and tap changer (Reference 172, 189). On January 17, 1997, the transformer was removed (Reference 314). Currently at the site, a steel housing covers clipped wires extending from conduits that lead directly underground. Clean gravel appears to have been backfilled in an area extending approximately 5 feet from the edge of the steel housing. No report detailing the removal of the transformer and any associated remedial activities was found (Reference 310). Because leaking was observed at the site after the initial remedial effort, the area warrants further investigation under TSCA.

3.3.9 Master Substation 2 (FACNO 271-MS2)

Master substation 2 is located in a fenced area southwest of Building 271. It contains transformers P50, PT-A, PT-B, PT-C, 40-14PT-A, 40-14PT-B, 40-15PT-A, 40-15PT-B, and Sub-2-1 (Reference 213). The only documented leakage occurred at transformers P50 and Sub-2-1.

Transformer P50 was leaky but was remediated in 1997. The area of the concrete pad that was cleaned measured approximately 50 ft^2. Analytical results from the last round of sampling contained PCBs at concentrations ranging from non-detect to 75 µg/100 cm^2, all below the TSCA limit of 100 µg/100 cm^2. In accordance with TSCA regulations for cleanup of industrial (i.e., restricted access) sites, the concrete surface was then sealed. One coat of white epoxy sealer was applied, followed by two coats of gray sealer. A report detailing the remediation activities (Reference 270) was submitted to OEPA, which approved the report (Reference 327).

A single wipe sample was taken from the concrete pad at Sub-2-1 in 1995. The sample contained PCBs at a concentration of 1,700 µg/100 cm^2 (Reference 168). Further investigation under TSCA is required at this transformer.

4.0 Investigation of VAP-Ineligible Properties

This section describes the investigative activities to be conducted under this Work Plan for VAP-ineligible sites at AFP 85. Section 4.1 describes the investigations to be conducted at VAP-ineligible UST sites to meet requirements of BUSTR and/or OEPA, depending on the type of substance historically stored at each former UST. Section 4.2 describes investigations to be conducted at VAP-ineligible PCB sites to meet the requirements of TSCA.

4.1 UST Sites

This section identifies the proposed sampling locations, the type and number of samples to be collected, the required analytical methods, and the methodology for sampling activities at each of VAP-ineligible UST sites that were identified in Section 3.2 with the exception of UST No. 287; a site assessment report for UST No. 287 has been submitted by ASC/EM to BUSTR for review. Further investigation is not currently planned at this UST, pending BUSTR's review of the site assessment.

The methodology for selecting sampling locations at the VAP-ineligible UST sites was suggested by a representative from the BUSTR office (Reference 322), and is described in Section 2.1 and each subsection below. Sampling locations were identified by using as-built drawings (Reference 313) that existed for the majority of these USTs. The USTs have been removed, and it is not known if associated piping was removed or remains in place. Since the USTs have been removed, the historic drawings are the basis for identifying the sampling locations. As a consequence, the proposed sampling locations should be viewed as approximations to the sampling methodology. The sampling locations may be adjusted based on geophysical survey results and/or other physical features encountered at each site.

As-built drawings were not identified during the record search for this Work Plan for UST FACNOs 3-106, 3-107, and 404-96. As a consequence, the BUSTR-suggested sampling methodology is not feasible at these locations. In these cases, a grid approach for sampling locations will be implemented at each site. These sampling locations may be adjusted based on geophysical survey results and/or other physical features encountered at each site.

Note that in the following subsections the number of samples to be collected at each site does not include QC samples (i.e., replicates and field blanks). The QC samples will be collected as described in Air Force Center for Environmental Excellence (AFCEE) guidance documents and are summarized in Section 5.0.

4.1.1 UST Nos. 103 and 104 (FACNOs 3-103 and 3-104)

Summary of UST Nos. 103 and 104

Nearest Facility (FACNO)	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Tank Diameter	Tank Length	Capacity (gallons)	Depth of Tank Bottom (bgs)
3-103	103	Northeast corner of Building 3	Jet Fuel (JP-4)	1941	Removed	8' 0"	40' 4"	15,000	11.5'
3-104	104	Northeast corner of Building 3	Jet Fuel (JP-4)	1941	Removed	8' 0"	40' 4"	15,000	11.5'

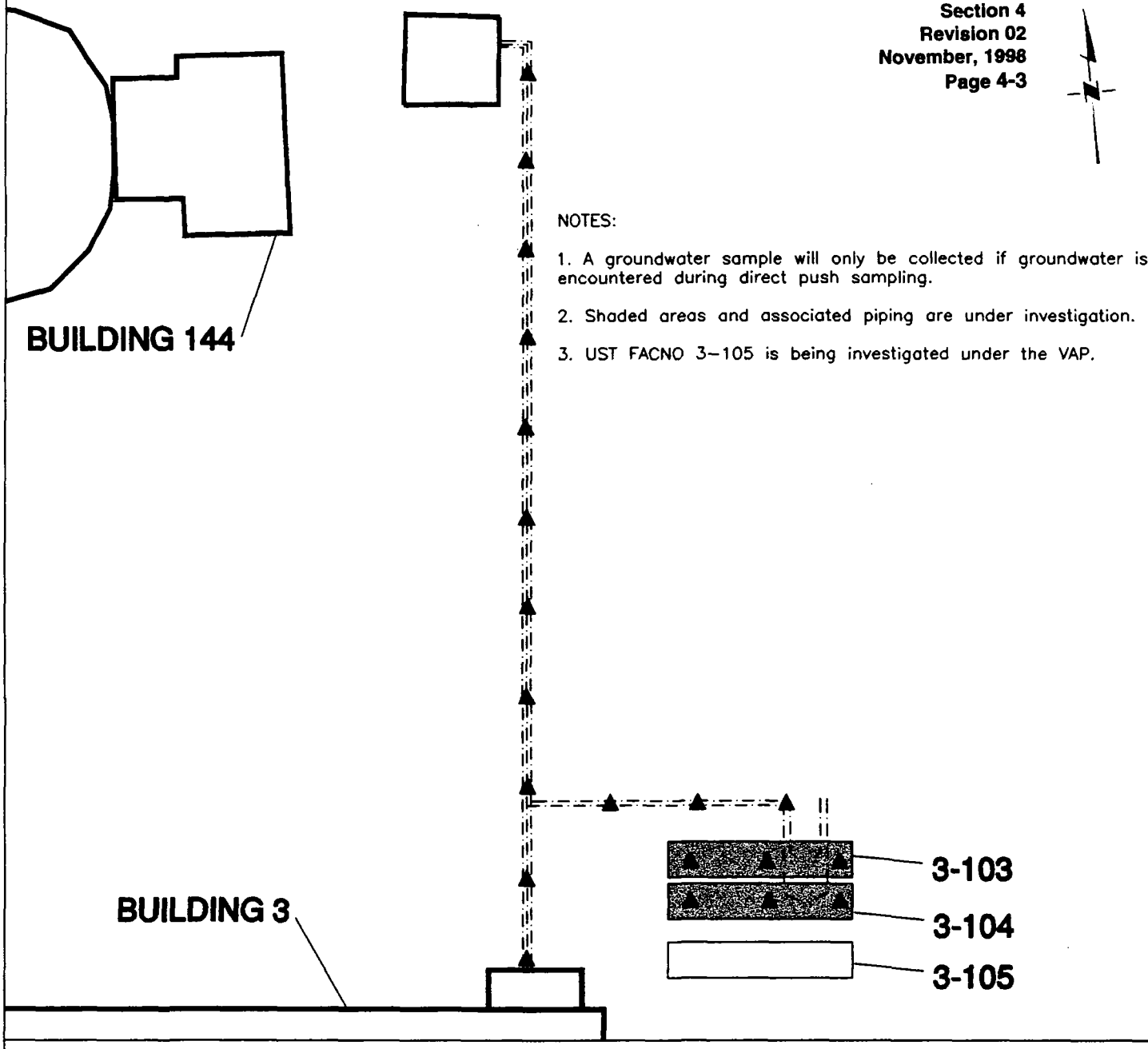
Primary Concern: Fuel constituents associated with JP-4. PHC and BTEX were detected in groundwater and soil samples collected at the site. VOCs and PAHs were detected in standing water from area surrounding the tanks. Section 3.0 provides detailed information concerning historical analytical data for the UST site.

Disposition of UST Systems: UST Nos. 103 and 104 were removed prior to December 22, 1988. It is unknown if associated piping was removed or remains in place.

Purpose of Sampling: To perform a site check under the BUSTR corrective action program provided in OAC 1301:7-9-13.

Investigative Activities: A geophysical clearance survey will be conducted at the site. As illustrated in Figure 4-1, soil and groundwater samples will be collected from an estimated 20 locations using direct push technology. Continuous sampling will be conducted at each location to a depth of 20 feet bgs, direct push refusal, or groundwater, whichever is encountered first. At each sampling location, soil samples will be field screened and, at a minimum, the soil sample with the highest PID reading will be sent to a laboratory for analysis. If soil samples from a sampling location do not register a PID reading, the soil sample from the bottom of the sampling location (or from immediately above the soil-groundwater interface if groundwater is encountered) will be sent to a laboratory for analysis. In addition to soil samples, if groundwater is encountered at a sampling location, a groundwater sample will also be sent to a laboratory for analysis. If groundwater is encountered but a groundwater sample cannot be collected, a soil sample from immediately above the soil-groundwater interface will be sent to a laboratory for analysis.

Sampling Locations: Sampling locations were selected based on guidance from a BUSTR representative (Reference 322) and on as-built drawings (Reference 313). The methodology for identifying sampling locations is: (1) a sampling location at both ends of former UST Nos. 103 and 104, and, because the length of each tank is greater than 35 feet, an additional sampling location in the middle of the former tanks; and (2) a sampling location every 20 feet along the piping runs that routinely contained regulated substances. If dispensing units and/or fill pipes are identified during the field investigation (neither are identified on the as-builts), additional sampling locations may be required. Because the USTs have been removed, the as-built drawings are the basis for identifying the sampling locations. Consequently, the proposed sampling locations should be viewed as approximations to the described methodology for



NOTES:

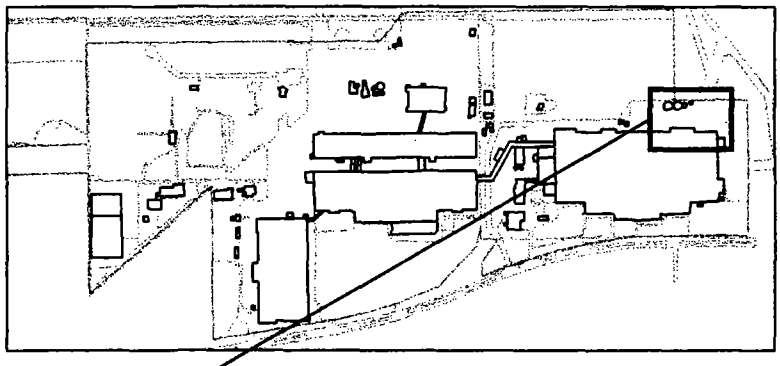
1. A groundwater sample will only be collected if groundwater is encountered during direct push sampling.
2. Shaded areas and associated piping are under investigation.
3. UST FACNO 3–105 is being investigated under the VAP.

Site Boundary

Building

UST Piping

▲ Proposed Direct Push Soil and Groundwater Sampling Location



0 17.5 35 70

Scale in Feet

EARTH TECH

Figure 4-1

UST FACNOs 3-103 and 3-104 Sampling Locations

AFP85WP.DWG/4-1.PLT

sampling locations. These locations may be adjusted based on geophysical survey results and/or other physical features encountered at the site.

Laboratory Analyses: The laboratory analyses required for substances stored in regulated USTs are provided in Table 1 of OAC 1301:7-9-13, presented here as Table 4-1. UST Nos. 103 and 104 stored JP-4 aviation fuel. Table 4-1 identifies jet fuel as a middle distillate (i.e., Table 4-1, Analytical Group 2) requiring the following analyses: (1) for soil samples, EPA Methods 8020 (BTEX), 8100 Modified (PAHs), and 418.1 (TPH); and (2) for groundwater samples, EPA Methods 602 (BTEX) and 610 (PAHs).

Number of Samples to be Collected at UST Nos. 103 and 104 (FACNOs 3-103 and 3-104)

Sampling Location	Number of Borings/ Holes	Soil[1]	Groundwater[2]
Direct Push Hole	20	20	20

(1) The number of soil samples is approximate. A minimum of one soil sample from each direct push hole will be sent to the laboratory; however, based on PID readings from continuous soil sampling, more than one soil sample may be sent to the laboratory.

(2) The number of groundwater samples will depend on encountering groundwater within 20 feet bgs at the site.

Table 4-1
Ohio State Fire Marshal Analytical Parameters and Methods

Analytical Group	Constituent	Analytical Method for Soil Samples	Analytical Method for Water Samples
1. Gasoline (motor gasoline, aviation gasoline, gasohol)	Benzene	USEPA Method 8020	USEPA Method 602
	Toluene	USEPA Method 8020	USEPA Method 602
	Ethyl benzene	USEPA Method 8020	USEPA Method 602
	Total xylenes	USEPA Method 8020	USEPA Method 602
	TPH	USEPA Method 8015 (Modified)	Not Applicable
2. Middle distillates (kerosene, diesel fuel, jet fuel and light oils)	Benzene	USEPA Method 8020	USEPA Method 602
	Toluene	USEPA Method 8020	USEPA Method 602
	Ethyl benzene	USEPA Method 8020	USEPA Method 602
	Total xylenes	USEPA Method 8020	USEPA Method 602
	PAH	USEPA Method 8100 (Modified)	USEPA Method 610
	TPH	USEPA Method 418.1	Not Applicable
3. Used oil and unknowns	VOA	USEPA Method 8240	USEPA Method 624
	TPH	USEPA Method 418.1	Not Applicable
4. Heavy fuel oils and lubricating oils	TPH	USEPA Method 418.1	Not Applicable
5. Other compounds	Not Applicable	Consult with the SFM	Consult with the SFM

Key: USEPA = Environmental Protection Agency
PAH = Polynuclear Aromatic Hydrocarbons
TPH = Total Petroleum Hydrocarbons
VOA = Volatile Organic Aromatics

4.1.2 UST Nos. 106 and 107 (FACNOs 3-106 and 3-107)

Summary of UST Nos. 106 and 107

Nearest Facility (FACNO)	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Tank Diameter	Tank Length	Capacity (gallons)	Depth of Tank Bottom (bgs)
3-106	106	Northeast corner of Building 3	Aviation Fuel	1954	Removed	5' 4"	12' 0"	2,000	--
3-107	107	Northeast corner of Building 3	Aviation Fuel	1954	Removed	5' 4"	12' 0"	2,000	--

Primary Concern: Fuel constituents associated with aviation fuel. Historical analytical data was not identified for this UST site during the records search for this Work Plan.

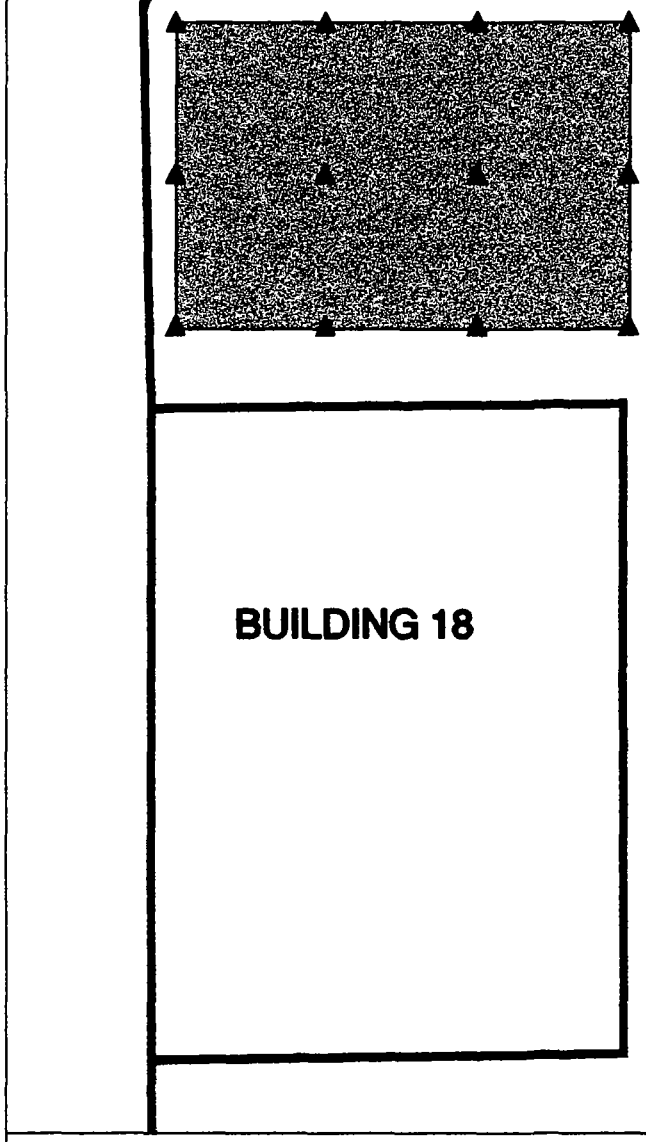
Disposition of UST Systems: UST Nos. 106 and 107 were removed prior to December 22, 1988. It is unknown if associated piping existed, was removed, or remains in place.

Purpose of Sampling: To perform a site check under the BUSTR corrective action program provided in OAC 1301:7-9-13.

Investigative Activities: A geophysical clearance survey will be conducted at the site. As illustrated in Figure 4-2, soil and groundwater samples will be collected from an estimated 12 locations using direct push technology. Continuous sampling will be conducted at each location to a depth of 20 feet bgs, direct push refusal, or groundwater, whichever is encountered first. At each sampling location, soil samples will be field screened and, at a minimum, the soil sample with the highest PID reading will be sent to a laboratory for analysis. If soil samples from a sampling location do not register a PID reading, the soil sample from the bottom of the sampling location (or from immediately above the soil-groundwater interface if groundwater is encountered) will be sent to a laboratory for analysis. In addition to soil samples, if groundwater is encountered at a sampling location, a groundwater sample will also be sent to a laboratory for analysis. If groundwater is encountered but a groundwater sample cannot be collected, a soil sample from immediately above the soil-groundwater interface will be sent to a laboratory for analysis.

Sampling Locations: As-built drawings for UST Nos. 106 and 107 were not identified during the records search for this Work Plan. Consequently, the BUSTR-suggested methodology for identifying sampling locations (described in subsection 2.1.1) was not feasible for this site. Instead, a grid approach will be used to determine the sampling locations. These locations may be adjusted based on geophysical survey results and/or other physical features encountered at the site.

Laboratory Analyses: The laboratory analyses required for substances stored in regulated USTs are provided in Table 1 of OAC 1301:7-9-13, presented here as Table 4-1. UST Nos. 106 and 107 stored aviation fuel. It is not known if the stored aviation fuel was gasoline or jet fuel. As a consequence, all analyses identified in Table 4-1 for gasoline and middle distillates (i.e.,



NOTES:

1. A groundwater sample will only be collected if groundwater is encountered during direct push sampling.

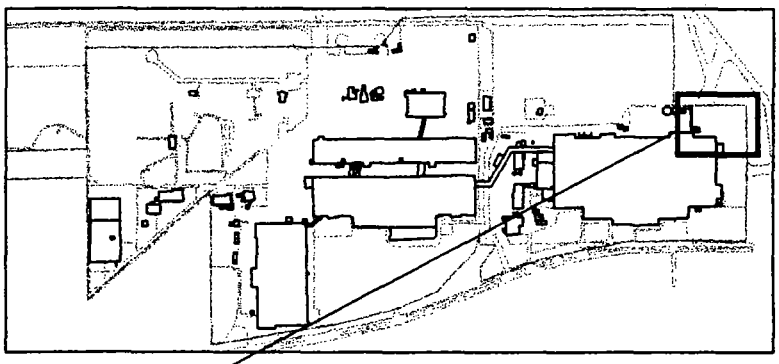
2. Shaded area is under investigation; soil borings will be installed along a grid because the exact locations of the USTs are unknown (no "as-builts" are available).

Site Boundary

Building

UST Piping

Proposed Direct Push Soil and Groundwater Sampling Location



Area of Interest

0 12.5 25 50

Scale in Feet

EARTH TECH

Figure 4-2

UST FACNOs 3-106 and 3-107 Sampling Locations

AFPBSWP.DWG/*.PLT

Table 4-1, Analytical Groups 1 and 2) are required. Specifically, the following analyses are required: (1) for soil samples, EPA Methods 8020 (BTEX), 8100 Modified (PAHs), 8015 Modified (TPH), and 418.1 (TPH); and (2) for groundwater samples, EPA Methods 602 (BTEX) and 610 (PAHs).

Number of Samples to be Collected at UST Nos. 106 and 107 (FACNOs 3-106 and 3-107)

Sampling Location	Number of Borings/ Holes	Soil[1]	Groundwater[2]
Direct Push Hole	12	12	12

(1) The number of soil samples is approximate. A minimum of one soil sample from each direct push hole will be sent to the laboratory; however, based on PID readings from continuous soil sampling, more than one soil sample may be sent to the laboratory.

(2) The number of groundwater samples will depend on encountering groundwater within 20 feet bgs at the site.

4.1.3 UST Nos. 98, 99 and 101 (FACNOs 3-98, 3-99 and 3-101)

Summary of UST Nos. 98, 99, and 101

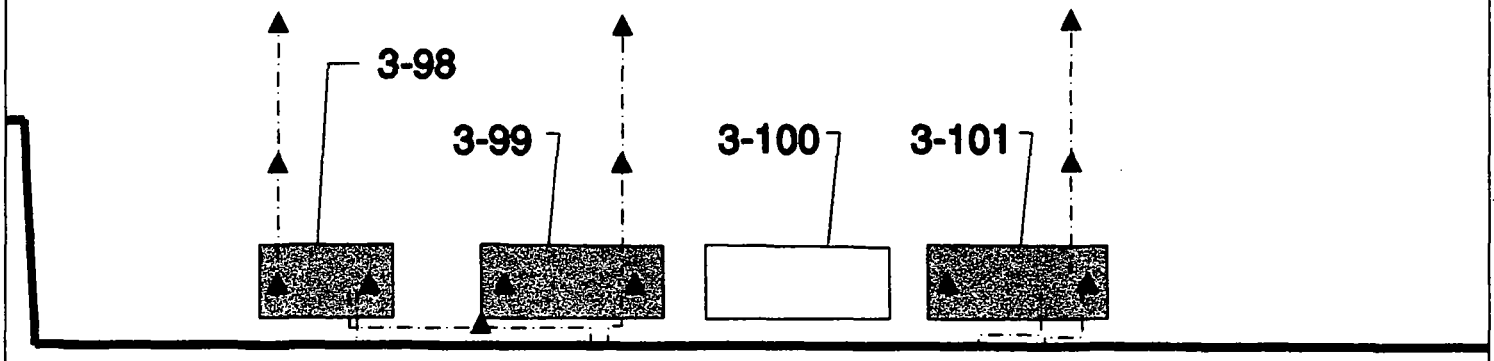
Nearest Facility (FACNO)	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Tank Diameter	Tank Length	Capacity (gallons)	Depth of Tank Bottom (bgs)
3-98	98	North side of Building 3	Cutting oil	1941	Removed	10' 0"	17' 2"	10,000	--
3-99	99	North side of Building 3	Water-based coolant oil	1941	Removed	10' 0"	26' 2"	15,000	9.5 feet
3-101	101	North side of Building 3	Water-based coolant oil	1941	Removed	10' 0"	26' 2"	15,000	--

Primary Concern: Fuel constituents associated with cutting oil and water-based coolant oil. PHC were detected in a groundwater sample collected at the site. Oil and grease and trichloroethene were detected in soil samples collected from the excavated soil pile for these USTs. Section 3.0 provides detailed information concerning historical analytical data for the UST site.

Disposition of UST Systems: UST Nos. 98, 99, and 101 were removed prior to December 22, 1988. It is unknown if associated piping was removed or remains in place.

Purpose of Sampling: To perform a site check under the BUSTR corrective action program provided in OAC 1301:7-9-13.

Investigative Activities: A geophysical clearance survey will be conducted at the site. As illustrated in Figure 4-3, soil and groundwater samples will be collected from an estimated 13 locations using direct push technology. Continuous sampling will be conducted at each location



BUILDING 3

NOTES:

1. A groundwater sample will only be collected if groundwater is encountered during direct push sampling.

2. Shaded areas and associated piping are under investigation.

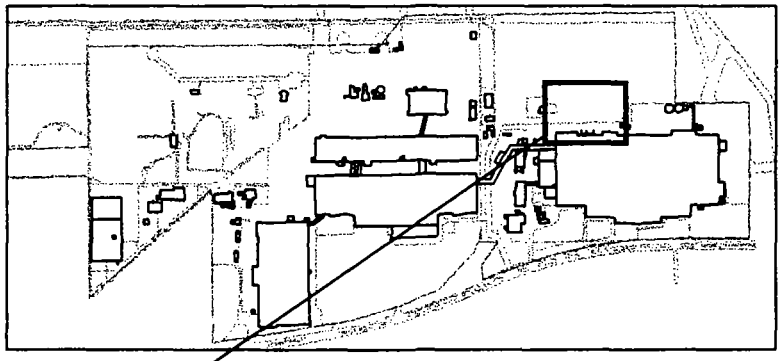
3. UST FACNO 3–100 has been granted clean closure by OEPA.

Site Boundary

Building

UST Piping

▲ Proposed Direct Push Soil and Groundwater Sampling Location



Area of Interest

0 12.5 25 50

Scale in Feet

EARTH TECH

Figure 4-3

UST FACNOs 3-98, 3-99, and 3-101 Sampling Locations

to a depth of 20 feet bgs, direct push refusal, or groundwater, whichever is encountered first. At each sampling location, soil samples will be field screened and, at a minimum, the soil sample with the highest PID reading will be sent to a laboratory for analysis. If soil samples from a sampling location do not register a PID reading, the soil sample from the bottom of the sampling location (or from immediately above the soil-groundwater interface if groundwater is encountered) will be sent to a laboratory for analysis. In addition to soil samples, If groundwater is encountered at a sampling location, a groundwater sample will also be sent to a laboratory for analysis. If groundwater is encountered but a groundwater sample cannot be collected, a soil sample from immediately above the soil-groundwater interface will be sent to a laboratory for analysis.

Sampling Locations: Sampling locations were selected based on guidance from a BUSTR representative (Reference 322) and on as-built drawings (Reference 313). The methodology for identifying sampling locations is: (1) a sampling location at both ends of former UST Nos. 98, 99, and 101; and (2) a sampling location every 20 feet along the piping runs that routinely contained regulated substances. If dispensing units and/or fill pipes are identified during the field investigation (neither are identified on the as-builts), additional sampling locations may be required. Because the USTs have been removed, the as-built drawings are the basis for identifying the sampling locations. Consequently, the proposed sampling locations should be viewed as approximations to the described methodology for sampling locations. These locations may be adjusted based on geophysical survey results and/or other physical features encountered at the site.

Laboratory Analyses: The laboratory analyses required for substances stored in regulated USTs are provided in Table 1 of OAC 1301:7-9-13, presented here as Table 4-1. UST No. 98 stored cutting oil, and UST Nos. 99 and 101 stored water-based coolant oil. Based on Table 4-1, cutting oil and water-based coolant oil (i.e., Table 4-1, Analytical Group 4) require the following analyses: (1) for soil samples, EPA Method 418.1 (TPH), and (2) for groundwater, no analyses are required by BUSTR. In addition to this analysis, since trichloroethene was historically detected in soil samples collected from excavated soil at the site, EPA Method 8260 (VOCs) is also required for soil and groundwater samples.

Number of Samples to be Collected at UST Nos. 98, 99, and 101 (FACNOs 3-98, 3-99, and 3-101)

Sampling Location	Number of Borings/ Holes	Soil[1]	Groundwater[2]
Direct Push Hole	13	13	13

(1) The number of soil samples is approximate. A minimum of one soil sample from each direct push hole will be sent to the laboratory; however, based on PID readings from continuous soil sampling, more than one soil sample may be sent to the laboratory.

(2) The number of groundwater samples will depend on encountering groundwater within 20 feet bgs at the site.

4.1.4 *UST Nos. FBA-1 and FBA-2 (FACNOs 4-FBA-1 and 4-FBA-2)*

Summary of UST Nos. FBA-1 and FBA-2

Nearest Facility (FACNO)	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Tank Diameter	Tank Length	Capacity (gallons)	Depth of Tank Bottom (bgs)
4-FBA-1	FBA-1	East side of Building 4	Stoddard solvent	1969	Removed	6' 4"	6' 0"	1,200	9.5 feet
4-FBA-2	FBA-2	East side of Building 4	Stoddard solvent	1969	Removed	6' 4"	6' 0"	1,200	--

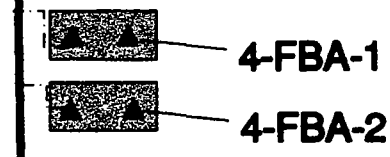
Primary Concern: Fuel constituents associated with stoddard solvent. TPH was detected in a groundwater sample collected at the site. Oil and grease was detected in soil samples collected at the site. Section 3.0 provides detailed information concerning historical analytical data for the UST site.

Disposition of UST Systems: UST Nos. FBA-1 and FBA-2 were removed prior to December 22, 1988. It is unknown if associated piping was removed or remains in place.

Purpose of Sampling: To perform a site check under the BUSTR corrective action program provided in OAC 1301:7-9-13.

Investigative Activities: A geophysical clearance survey will be conducted at the site. As illustrated in Figure 4-4, soil and groundwater samples will be collected from an estimated 4 locations using direct push technology. Continuous sampling will be conducted at each location to a depth of 20 feet bgs, direct push refusal, or groundwater, whichever is encountered first. At each sampling location, soil samples will be field screened and, at a minimum, the soil sample with the highest PID reading will be sent to a laboratory for analysis. If soil samples from a sampling location do not register a PID reading, the soil sample from the bottom of the sampling location (or from immediately above the soil-groundwater interface if groundwater is encountered) will be sent to a laboratory for analysis. In addition to soil samples, if groundwater is encountered at a sampling location, a groundwater sample will also be sent to a laboratory for analysis. If groundwater is encountered but a groundwater sample cannot be collected, a soil sample from immediately above the soil-groundwater interface will be sent to a laboratory for analysis.

Sampling Locations: Sampling locations were selected based on guidance from a BUSTR representative (Reference 322) and on as-built drawings (Reference 313). The methodology for identifying sampling locations is a sampling location at both ends of a former UST Nos. FBA-1 and FBA-2. If dispensing units and/or fill pipes are identified during the field investigation (neither are identified on the as-builts), additional sampling locations may be required. Because the USTs have been removed, the as-built drawings are the basis for identifying the sampling locations. Consequently, the proposed sampling locations should be viewed as approximations to the described methodology for sampling locations. These locations may be adjusted based on geophysical survey results and/or other physical features encountered at the site.



NOTES:

1. A groundwater sample will only be collected if groundwater is encountered during direct push sampling.

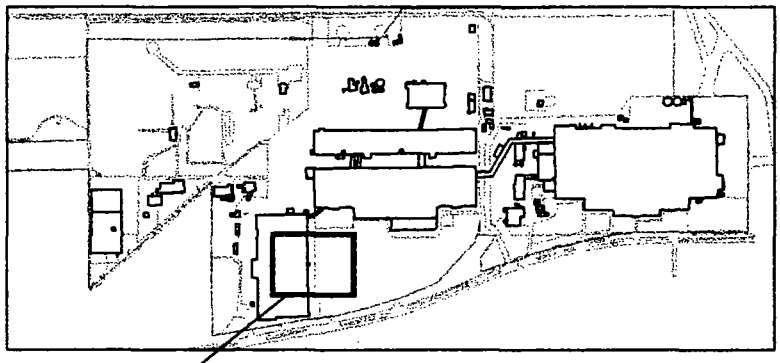
2. Shaded areas and associated piping are under investigation.

Site Boundary

Building

UST Piping

▲ Proposed Direct Push Soil and Groundwater Sampling Location



Area of Interest

0 12.5 25 50

Scale in Feet

EARTH TECH

Figure 4-4

UST FACNOs 4-FBA-1 and 4-FBA-2 Sampling Locations

Laboratory Analyses: The laboratory analyses required for substances stored in regulated USTs are provided in Table 1 of OAC 1301:7-9-13, presented here as Table 4-1. UST Nos. FBA-1 and FBA-2 stored stoddard solvent. Based on guidance from a BUSTR representative (Reference 325), stoddard solvent requires the following analyses: (1) for soil samples, EPA Methods 8020 (BTEX), 8100 Modified (PAHs), and 8015 Modified (Gasoline Range Organics and Diesel Range Organics); and (2) for groundwater samples, EPA Methods 602 (BTEX) and 610 (PAHs).

Number of Samples to be Collected at UST Nos. FBA-1 and FBA-2 (FACNOs 4-FBA-1 and 4-FBA-2)

Sampling Location	Number of Borings/ Holes	Soil[1]	Groundwater[2]
Direct Push Hole	4	4	4

(1) The number of soil samples is approximate. A minimum of one soil sample from each direct push hole will be sent to the laboratory; however, based on PID readings from continuous soil sampling, more than one soil sample may be sent to the laboratory.

(2) The number of groundwater samples will depend on encountering groundwater within 20 feet bgs at the site.

4.1.5 UST Nos. 159 and 160 (FACNOs 5-159 and 5-160)

Summary of UST Nos. 159 and 160

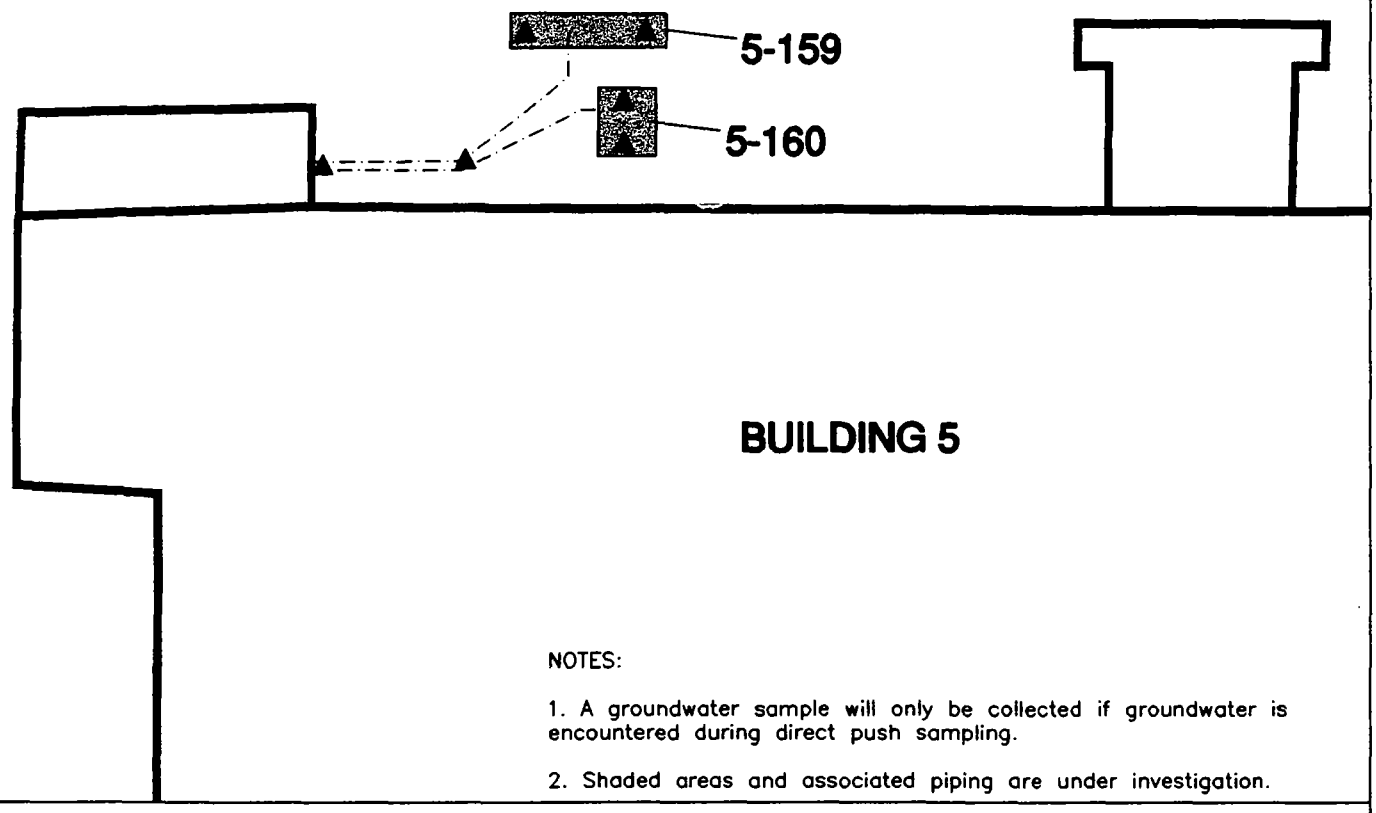
Nearest Facility (FACNO)	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Tank Diameter	Tank Length	Capacity (gallons)	Depth of Tank Bottom (bgs)
5-159	159	North side of Building 5	Solvents (probably lacquer thinner)	1954	Removed	5' 0"	19' 0"	2,500	12 feet
5-160	160	North side of Building 5	Solvent	1954	Removed	7' 0"	9' 6"	2,000	12 feet

Primary Concern: VOCs associated with solvents (probably lacquer thinner) and a flammable solvent used for painting. Section 3.0 provides detailed information concerning historical analytical data for the UST site.

Disposition of UST Systems: UST Nos. 159 and 160 were removed prior to December 22, 1988. It is unknown if associated piping was removed or remains in place.

Purpose of Sampling: To perform a site check under the BUSTR corrective action program provided in OAC 1301:7-9-13.

Investigative Activities: A geophysical clearance survey will be conducted at the site. As illustrated in Figure 4-5, soil and groundwater samples will be collected from an estimated 6 locations using direct push technology. Continuous sampling will be conducted at each location to a depth of 20 feet bgs, direct push refusal, or groundwater, whichever is encountered first. At each sampling location, soil samples will be field screened and, at a minimum, the soil sample with the highest PID reading will be sent to a laboratory for analysis. If soil samples from a



NOTES:

1. A groundwater sample will only be collected if groundwater is encountered during direct push sampling.

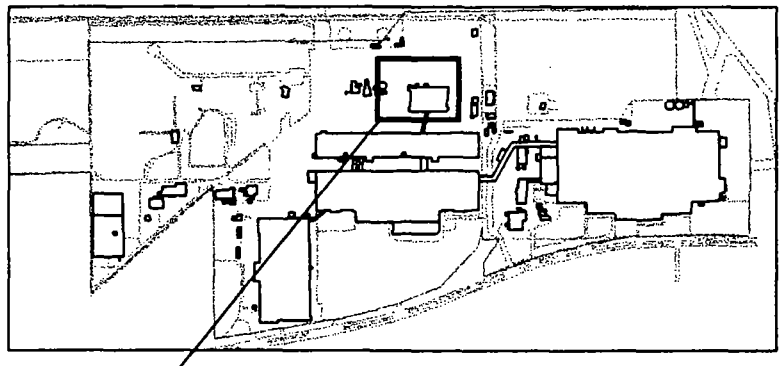
2. Shaded areas and associated piping are under investigation.

Site Boundary

Building

UST Piping

▲ Proposed Direct Push Soil and Groundwater Sampling Location



0 12.5 25 50

Scale in Feet

EARTH TECH

Figure 4-5

UST FACNOs 5-159 and 5-160 Sampling Locations

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sampling location do not register a PID reading, the soil sample from the bottom of the sampling location (or from immediately above the soil-groundwater interface if groundwater is encountered) will be sent to a laboratory for analysis. In addition to soil samples, if groundwater is encountered at a sampling location, a groundwater sample will also be sent to a laboratory for analysis. If groundwater is encountered but a groundwater sample cannot be collected, a soil sample from immediately above the soil-groundwater interface will be sent to a laboratory for analysis.

Sampling Locations: Sampling locations were selected based on guidance from a BUSTR representative (Reference 322) and on as-built drawings (Reference 313). The methodology for identifying sampling locations is: (1) a sampling location at both ends of a former UST Nos. 159 and 160; and (2) a sampling location every 20 feet along the piping runs that routinely contained regulated substances. If dispensing units and/or fill pipes are identified during the field investigation (neither are identified on the as-builts), additional sampling locations may be required. Because the USTs have been removed, the as-built drawings are the basis for identifying the sampling locations. Consequently, the proposed sampling locations should be viewed as approximations to the described methodology for sampling locations. These locations may be adjusted based on geophysical survey results and/or other physical features encountered at the site.

Laboratory Analyses: The laboratory analyses required for substances stored in regulated USTs are provided in Table 1 of OAC 1301:7-9-13, presented here as Table 4-1. UST Nos. 159 and 160 stored a solvent (probably lacquer thinner) and a solvent that was used for painting, respectively. These solvents are classified as Analytical Group 5 in Table 4-1. A BUSTR representative recommended using laboratory-recommended analyses based on the substance stored in the former USTs (Reference 326). The following analyses are required: (1) for soil samples, EPA Method 8260 (VOCs) and 8270 (SVOCs); and (2) for groundwater samples, EPA Method 8260 (VOCs) and 8270 (SVOCs).

Number of Samples to be Collected at UST Nos. 159 and 160 (FACNOs 5-159 and 5-160)

Sampling Location	Number of Borings/ Holes	Soil[1]	Groundwater[2]
Direct Push Hole	6	6	6

(1) The number of soil samples is approximate. A minimum of one soil sample from each direct push hole will be sent to the laboratory; however, based on PID readings from continuous soil sampling, more than one soil sample may be sent to the laboratory.

(2) The number of groundwater samples will depend on encountering groundwater within 20 feet bgs at the site.

4.1.6 UST 92 (FACNO 9-92)

Summary of UST No. 92

Nearest Facility (FACNO)	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Tank Diameter	Tank Length	Capacity (gallons)	Depth of Tank Bottom (bgs)
9-92	92	North side of Building 9	Gasoline	1941	Removed	8' 0"	40' 0"	15,000	12.5 feet

Primary Concern: Fuel constituents associated with gasoline. Oil and grease and BTEX were detected in soil samples collected at the site. Section 3.0 provides detailed information concerning historical analytical data for the UST site.

Disposition of UST Systems: UST No. 92 was removed prior to December 22, 1988. It is unknown if associated piping was removed or remains in place.

Purpose of Sampling: To perform a site check under the BUSTR corrective action program provided in OAC 1301:7-9-13.

Investigative Activities: A geophysical clearance survey will be conducted at the site. As illustrated in Figure 4-6, soil and groundwater samples will be collected from an estimated 7 locations using direct push technology. Continuous sampling will be conducted at each location to a depth of 20 feet bgs, direct push refusal, or groundwater, whichever is encountered first. At each sampling location, soil samples will be field screened and, at a minimum, the soil sample with the highest PID reading will be sent to a laboratory for analysis. If soil samples from a sampling location do not register a PID reading, the soil sample from the bottom of the sampling location (or from immediately above the soil-groundwater interface if groundwater is encountered) will be sent to a laboratory for analysis. In addition to soil samples, if groundwater is encountered at a sampling location, a groundwater sample will also be sent to a laboratory for analysis. If groundwater is encountered but a groundwater sample cannot be collected, a soil sample from immediately above the soil-groundwater interface will be sent to a laboratory for analysis.

Sampling Locations: Sampling locations were selected based on guidance from a BUSTR representative (Reference 322) and on as-built drawings (Reference 313). The methodology for identifying sampling locations is: (1) a sampling location at both ends of former UST No. 92, and because the tank length is greater than 35 feet, an additional sampling location in the middle of the former tank; and (2) a sampling location every 20 feet along the piping run that routinely contained regulated substances. If dispensing units and/or fill pipes are identified during the field investigation (neither are identified on the as-builts), additional sampling locations may be required. Because the USTs have been removed, the as-built drawings are the basis for identifying the sampling locations. Consequently, the proposed sampling locations should be viewed as approximations to the described methodology for sampling locations. These locations may be adjusted based on geophysical survey results and/or other physical features encountered at the site.

Laboratory Analyses: The laboratory analyses required for substances stored in regulated USTs are provided in Table 1 of OAC 1301:7-9-13, presented here as Table 4-1. UST No. 92 stored gasoline. Based on Table 4-1, gasoline (i.e., Table 4-1, Analytical Group 1) requires the following analyses: (1) for soil samples, EPA Methods 8020 (BTEX), and 8015 (Modified) (TPH); and (2) for groundwater samples, EPA Method 602 (BTEX).

BUILDING 8

9-92

BUILDING 9

NOTES:

1. A groundwater sample will only be collected if groundwater is encountered during direct push sampling.

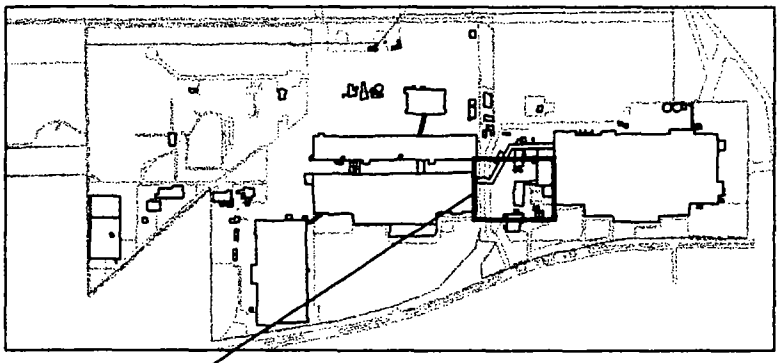
2. Shaded areas and associated piping are under investigation.

Site Boundary

Building

UST Piping

▲ Proposed Direct Push Soil and Groundwater Sampling Location



Area of Interest

0 12.5 25 50

Scale in Feet

EARTH TECH

Figure 4-6

UST FACNO 9-92
Sampling Locations

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Number of Samples to be Collected at UST No. 92 (FACNO 9-92)			
Sampling Location	Number of Borings/ Holes	Soil[1]	Groundwater[2]
Direct Push Hole	7	7	7

(1) The number of soil samples is approximate. A minimum of one soil sample from each direct push hole will be sent to the laboratory; however, based on PID readings from continuous soil sampling, more than one soil sample may be sent to the laboratory.

(2) The number of groundwater samples will depend on encountering groundwater within 20 feet bgs at the site.

4.1.7 UST Nos. 146 and 147 (FACNOs 10-146 and 10-147)

Summary of UST Nos. 146 and 147									
Nearest Facility (FACNO)	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Tank Diameter	Tank Length	Capacity (gallons)	Depth of Tank Bottom (bgs)
10-146	146	East side of Building 10	Trichloroethane	1954	Removed	7' 0"	10' 6"	3,000	10 feet
10-147	147	East side of Building 10	Trichloroethane, Trichloroethene	1954	Removed	7' 0"	17' 6"	5,000	10 feet

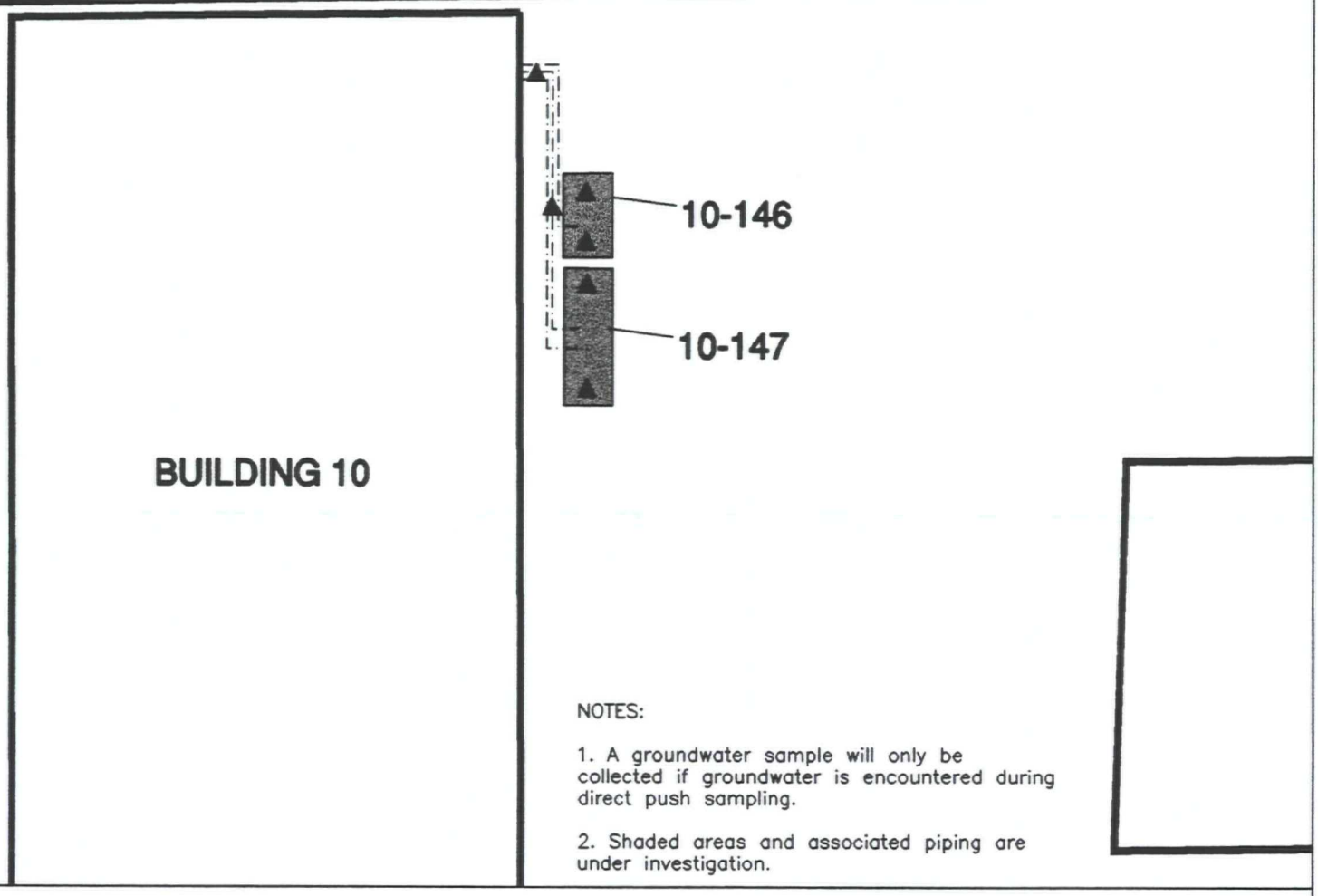
Primary Concern: Trichloroethane, trichloroethene, and degradation analytes. 1,1,1-trichloroethane, cis-1,2-dichloroethene, and trichloroethene were detected in a soil and groundwater samples collected at the site. 1,1-dichloroethane was also detected in soil samples but not in groundwater samples. PHC and toluene were detected in groundwater samples collected at the site; the source of petroleum at this site is unknown. Section 3.0 provides detailed information concerning historical analytical data for the UST site.

Disposition of UST Systems: UST Nos. 146 and 147 were removed prior to December 22, 1988. It is unknown if associated piping was removed or remains in place.

Purpose of Sampling: To perform a site check under the BUSTR corrective action program provided in OAC 1301:7-9-13.

Investigative Activities: A geophysical clearance survey will be conducted at the site. As illustrated in Figure 4-7, soil and groundwater samples will be collected from an estimated 6 locations using direct push technology. Continuous sampling will be conducted at each location to a depth of 20 feet bgs, direct push refusal, or groundwater, whichever is encountered first. At each sampling location, soil samples will be field screened and, at a minimum, the soil sample with the highest PID reading will be sent to a laboratory for analysis. If soil samples from a sampling location do not register a PID reading, the soil sample from the bottom of the sampling location (or from immediately above the soil-groundwater interface if groundwater is encountered) will be sent to a laboratory for analysis. In addition to soil samples, if groundwater is encountered at a sampling location, a groundwater sample will also be sent to a laboratory for analysis. If groundwater is encountered but a groundwater sample cannot be collected, a soil sample from immediately above the soil-groundwater interface will be sent to a laboratory for analysis.

COVERED PASSAGEWAY



EARTH TECH

Figure 4-7

UST FACNOs 10-146 and 10-147 Sampling Locations

Sampling Locations: Sampling locations were selected based on guidance from a BUSTR representative (Reference 322) and on as-built drawings (Reference 313). The methodology for identifying sampling locations is: (1) a sampling location at both ends of former UST Nos. 146 and 147; and (2) a sampling location every 20 feet along the piping runs that routinely contained regulated substances. If dispensing units and/or fill pipes are identified during the field investigation (neither are identified on the as-builts), additional sampling locations may be required. Because the USTs have been removed, the as-built drawings are the basis for identifying the sampling locations. Consequently, the proposed sampling locations should be viewed as approximations to the described methodology for sampling locations. These locations may be adjusted based on geophysical survey results and/or other physical features encountered at the site.

Laboratory Analyses: The laboratory analyses required for substances stored in regulated USTs are provided in Table 1 of OAC 1301:7-9-13, presented here as Table 4-1. UST No. 146 stored trichloroethane, and UST 147 stored trichloroethane and trichloroethene. Based on Table 4-1, trichloroethane and trichloroethene are classified as Analytical Group 5 in Table 4-1. A BUSTR representative recommended using laboratory-recommended analyses based on the substance stored in the former USTs (Reference 326). The following analyses are required: (1) for soil samples, EPA Method 8260 (VOCs); and (2) for groundwater samples, EPA Methods 8260 (VOCs). In addition to these analyses, since PHC and toluene were detected in groundwater at the site from an unknown source, EPA Method 418.1 (TPH) and 8015 Modified (TPH) will also be required for soil samples to meet requirements of BUSTR.

Number of Samples to be Collected at UST Nos. 146 and 147 (FACNOs 10-146 and 10-147)

Sampling Location	Number of Borings/ Holes	Soil[1]	Groundwater[2]
Direct Push Hole	6	6	6

(1) The number of soil samples is approximate. A minimum of one soil sample from each direct push hole will be sent to the laboratory; however, based on PID readings from continuous soil sampling, more than one soil sample may be sent to the laboratory.

(2) The number of groundwater samples will depend on encountering groundwater within 20 feet bgs at the site.

4.1.8 UST No. 287 (FACNO 10-287)

Summary of UST No. 287

Nearest Facility (FACNO)	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Tank Diameter	Tank Length	Capacity (gallons)	Depth of Tank Bottom (bgs)
10-287	287	Northeast of Building 10	Waste (PCB) oil	1964	Removed	7' 0"	21' 0"	6,000	10 feet

Primary Concern: Waste PCB oil. PHC and VOCs were detected in groundwater samples collected at the site. Oil and grease, VOCs, and Aroclor 1248 were detected in soil samples collected from the excavation pit. Section 3.0 provides detailed information concerning historical analytical data for the UST site.

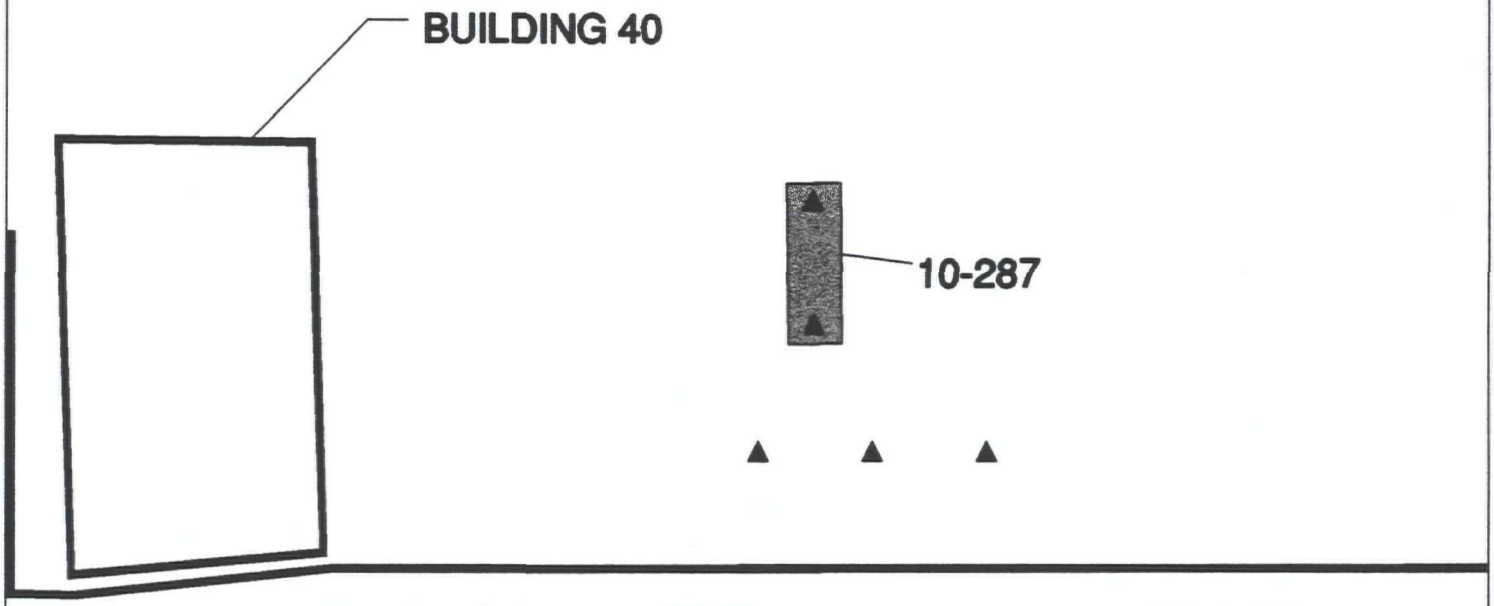
Disposition of UST Systems: UST No. 287 was removed prior to December 22, 1988. It is unknown if associated piping was removed or remains in place.

Purpose of Sampling: To perform a site check under the BUSTR corrective action program provided in OAC 1301:7-9-13.

Investigative Activities: A geophysical clearance survey will be conducted at the site. As illustrated in Figure 4-8, soil and groundwater samples will be collected from an estimated 5 locations using direct push technology. Continuous sampling will be conducted at each location to a depth of 20 feet bgs, direct push refusal, or groundwater, whichever is encountered first. At each sampling location, soil samples will be field screened and, at a minimum, the soil sample with the highest PID reading will be sent to a laboratory for analysis. If soil samples from a sampling location do not register a PID reading, the soil sample from the bottom of the sampling location (or from immediately above the soil-groundwater interface if groundwater is encountered) will be sent to a laboratory for analysis. In addition to soil samples, if groundwater is encountered at a sampling location, a groundwater sample will also be sent to a laboratory for analysis. If groundwater is encountered but a groundwater sample cannot be collected, a soil sample from immediately above the soil-groundwater interface will be sent to a laboratory for analysis.

Sampling Locations: Sampling locations were selected based on guidance from a BUSTR representative (Reference 322) and on as-built drawings (Reference 313). The methodology for identifying sampling locations is: (1) a sampling location at both ends of former UST No. 287. In addition, because petroleum hydrocarbons were detected at 14,200 mg/L, three additional sampling locations outside the UST were added. If dispensing units and/or fill pipes are identified during the field investigation (neither are identified on the as-builts), additional sampling locations may be required. Because the USTs have been removed, the as-built drawings are the basis for identifying the sampling locations. Consequently, the proposed sampling locations should be viewed as approximations to the described methodology for sampling locations. These locations may be adjusted based on geophysical survey results and/or other physical features encountered at the site.

Laboratory Analyses: The laboratory analyses required for substances stored in regulated USTs are provided in Table 1 of OAC 1301:7-9-13, presented here as Table 4-1. UST No. 287 stored waste PCB oil. Based on Table 4-1, used oils (i.e., Table 4-1, Analytical Group 3) require the following analyses: (1) for soil samples, EPA Methods 8240 (VOCs) and 418.1 (TPH); and (2) for groundwater samples, EPA Method 624 (VOCs). In addition to these analyses, because Aroclor 1248 was detected in soil samples collected at the site, EPA Method 8082 (PCBs) will be required for soil and groundwater samples.



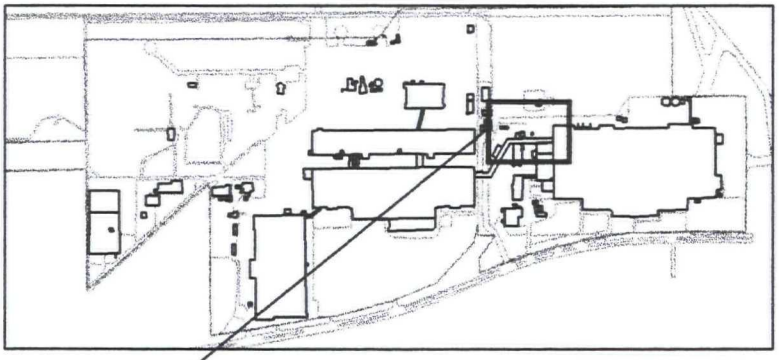
NOTES:
1. A groundwater sample will only be collected if groundwater is encountered during direct push sampling.
2. Shaded areas and associated piping are under investigation.
3. Because petroleum hydrocarbons were detected at 14,200mg/L, additional sampling locations outside the UST were added.

Site Boundary

Building

UST Piping

▲ Proposed Direct Push Soil and Groundwater Sampling Location



Area of Interest

0 12.5 25 50

Scale in Feet

EARTH TECH

Figure 4-8

UST FACNO 10-287
Sampling Locations

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Number of Samples to be Collected at UST No. 287 (FACNO 10-287)			
Sampling Location	Number of Borings/ Holes	Soil[1]	Groundwater[2]
Direct Push Hole	5	5	5

(1) The number of soil samples is approximate. A minimum of one soil sample from each direct push hole will be sent to the laboratory; however, based on PID readings from continuous soil sampling, more than one soil sample may be sent to the laboratory.
(2) The number of groundwater samples will depend on encountering groundwater within 20 feet bgs at the site.

4.1.9 UST Nos. 545 and 546 (FACNOs 10-545 and 10-546)

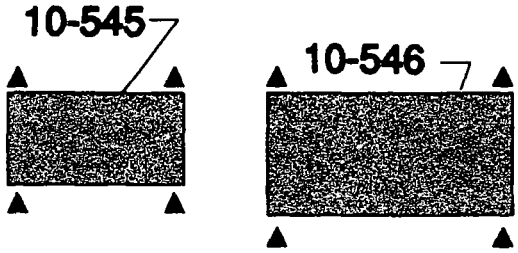
Summary of UST Nos. 545 and 546									
Nearest Facility (FACNO)	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Tank Diameter	Tank Length	Capacity (gallons)	Depth of Tank Bottom (bgs)
10-545	545	Northwest of Building 10	Waste Oil	1988	Removed	8'	27'	10,000	-
10-546	546	Northwest of Building 10	Degreaser/ Trichloroethane	1988	Removed	5' 4"	18'	3,000	-

Primary Concern: Waste oil and trichloroethane. Section 3.0 provides detailed information concerning historical analytical data for the UST site.

Disposition of UST Systems: UST Nos. 545 and 546 were removed in October, 1997. It is unknown if associated piping existed, was removed or remains in place.

Purpose of Sampling: To perform a site check under the BUSTR corrective action program provided in OAC 1301:7-9-13.

Investigative Activities: A geophysical clearance survey will be conducted at the site. As illustrated in Figure 4-9, soil and groundwater samples will be collected from an estimated 8 locations using direct push technology. Continuous sampling will be conducted at each location to a depth of 20 feet bgs, direct push refusal, or groundwater, whichever is encountered first. At each sampling location, soil samples will be field screened and, at a minimum, the soil sample with the highest PID reading will be sent to a laboratory for analysis. If soil samples from a sampling location do not register a PID reading, the soil sample from the bottom of the sampling location (or from immediately above the soil-groundwater interface if groundwater is encountered) will be sent to a laboratory for analysis. In addition to soil samples, if groundwater is encountered at a sampling location, a groundwater sample will also be sent to a laboratory for analysis. If groundwater is encountered but a groundwater sample cannot be collected, a soil sample from immediately above the soil-groundwater interface will be sent to a laboratory for analysis.



BUILDING 40

NOTES:

1. A groundwater sample will only be collected if groundwater is encountered during direct push sampling.

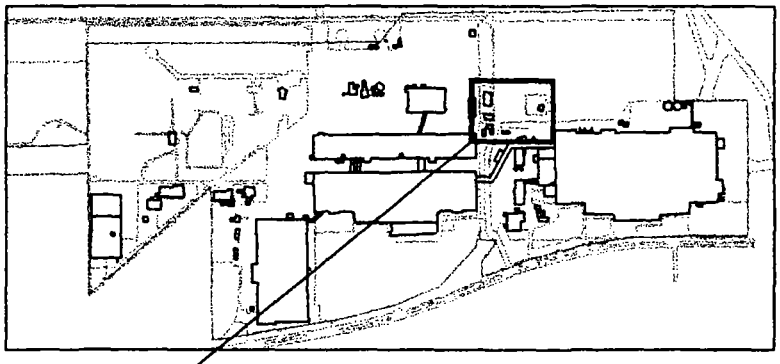
2. Shaded areas and associated piping are under investigation.

Site Boundary

Building

UST Piping

Proposed Direct Push Soil and Groundwater Sampling Location



Area of Interest

0 12.5 25 50

Scale in Feet

EARTH TECH

Figure 4-9

UST FACNOs 10-545 and 10-546 Sampling Locations

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Sampling Locations: Proposal sampling locations are based on as-built drawings (Reference 313). UST Nos. 545 and 546 were stored in concrete vaults. After removal of the USTs, the vaults were filled with 302 stone. For each vault, a sampling location is proposed at each corner of the vault rather than at the ends of each UST as specified by BUSTR. Samples will not be collected beneath each UST because it will not be possible to install a boring through the stone fill and concrete vault using direct push technology. Instead, borings will be installed at the corners of the vaults, where the potential for leakage is greatest. These locations may be adjusted based on geophysical survey results and/or other physical features encountered at the site.

Laboratory Analyses: The laboratory analyses required for substances stored in regulated USTs are provided in Table 1 of OAC 1301:7-9-13, presented here as Table 4-1. UST No. 545 stored waste oil and UST No. 546 stored trichloroethane. Based on Table 4-1, waste oil (i.e., Table 4-1, Analytical Group 3) requires the following analyses for the 4 soil and 4 groundwater samples to be collected at UST No. 545: (1) for soil samples, EPA Methods 8240 (VOCs) and 418.1 (TPH); and (2) for groundwater samples, EPA Methods 624 (VOCs).

Based on Table 4-1, trichloroethane is categorized in Analytical Group 5 in Table 4-1. A BUSTR representative recommended using laboratory-recommended analyses based on the substance stored in the former UST (Reference 326). The following analyses are required for the 4 soil and 4 groundwater samples to be collected at UST No. 546: (1) for soil samples, EPA Method 8260; and (2) for groundwater samples, EPA Method 8260.

Number of Samples to be Collected at UST Nos. 545 and 546 (FACNO 10-545 and 10-546)

Sampling Location	Number of Borings/ Holes	Soil[1]	Groundwater[2]
Direct Push Hole	8	8	8

(1) The number of soil samples is approximate. A minimum of one soil sample from each direct push hole will be sent to the laboratory; however, based on PID readings from continuous soil sampling, more than one soil sample may be sent to the laboratory.

(2) The number of groundwater samples will depend on encountering groundwater within 20 feet bgs at the site.

4.1.10 UST No. 97 (FACNO 21-97)

Summary of UST No. 97

Nearest Facility (FACNO)	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Tank Diameter	Tank Length	Capacity (gallons)	Depth of Tank Bottom (bgs)
21-97	97	Southeast corner Building 21 (underneath building)	Waste cutting oil	1941	Inactive (filled with concrete)	10' 0"	17' 2"	10,000	13 feet

Primary Concern: Waste cutting oil. Oil and grease and Aroclors 1248 and 1260 were detected in a sludge sample collected from UST No. 97. Oil and grease, Aroclor 1248, and trans-1,2-dichloroethene were detected in soil samples collected at the site. Section 3.0 provides detailed information concerning historical analytical data for the UST site.

Disposition of UST Systems: UST Nos. 97 was left in place and filled with concrete prior to December 22, 1988. It is unknown if associated piping was removed or remains in place.

Purpose of Sampling: To perform a site check under the BUSTR corrective action program provided in OAC 1301:7-9-13.

Investigative Activities: A geophysical clearance survey will be conducted at the site. As illustrated in Figure 4-10, soil and groundwater samples will be collected from an estimated 2 locations using direct push technology. Continuous sampling will be conducted at each location to a depth of 20 feet bgs, direct push refusal, or groundwater, whichever is encountered first. At each sampling location, soil samples will be field screened and, at a minimum, the soil sample with the highest PID reading will be sent to a laboratory for analysis. If soil samples from a sampling location do not register a PID reading, the soil sample from the bottom of the sampling location (or from immediately above the soil-groundwater interface if groundwater is encountered) will be sent to a laboratory for analysis. In addition to soil samples, if groundwater is encountered at a sampling location, a groundwater sample will also be sent to a laboratory for analysis. If groundwater is encountered but a groundwater sample cannot be collected, a soil sample from immediately above the soil-groundwater interface will be sent to a laboratory for analysis.

Sampling Locations: Sampling locations were selected based on guidance from a BUSTR representative (Reference 322) and on as-built drawings (Reference 313). The methodology for identifying sampling locations is a sampling location at both ends of former UST No. 97. If dispensing units and/or fill pipes are identified during the field investigation (neither are identified on the as-builts), additional sampling locations may be required. Because the USTs have been removed, the as-built drawings are the basis for identifying the sampling locations. Consequently, the proposed sampling locations should be viewed as approximations to the described methodology for sampling locations. These locations may be adjusted based on geophysical survey results and/or other physical features encountered at the site.

Laboratory Analyses: The laboratory analyses required for substances stored in regulated USTs are provided in Table 1 of OAC 1301:7-9-13, presented here as Table 4-1. UST No. 97 stored waste cutting oil. Based on Table 4-1, waste cutting oils (i.e., Table 4-1, Analytical Group 3) require the following analyses: (1) for soil samples, EPA Methods 8240 (VOCs) and 418.1 (TPH); and (2) for groundwater samples, EPA Method 624 (VOCs). In addition to these analyses, because Aroclor 1248 was detected in soil samples collected at the site, EPA Method 8082 (PCBs) will be required for soil and groundwater samples.

BUILDING 21

21-97

BUILDING 28

BUILDING 3

NOTES:

1. A groundwater sample will only be collected if groundwater is encountered during direct push sampling.

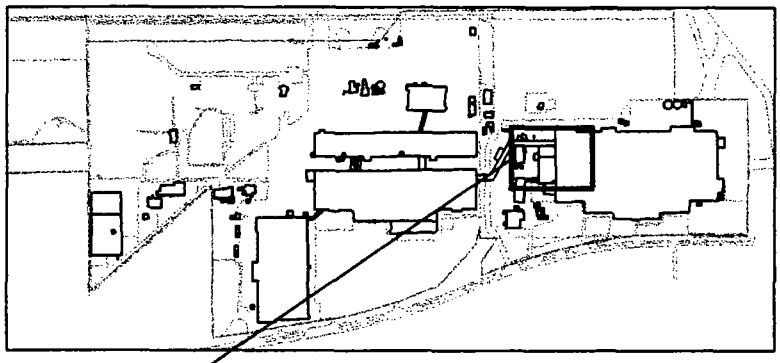
2. Shaded areas and associated piping are under investigation.

Site Boundary

Building

UST Piping

▲ Proposed Direct Push Soil and Groundwater Sample Location



Area of Interest

0 12.5 25 50

Scale in Feet

EARTH TECH

Figure 4-10

UST FACNO 21-97
Sampling Locations

AFP85WP.DWG/*.PLT

Number of Samples to be Collected at UST No. 97 (FACNO 21-97)			
Sampling Location	Number of Borings/ Holes	Soil[1]	Groundwater[2]
Direct Push Hole	2	2	2

(1) The number of soil samples is approximate. A minimum of one soil sample from each direct push hole will be sent to the laboratory; however, based on PID readings from continuous soil sampling, more than one soil sample may be sent to the laboratory.
(2) The number of groundwater samples will depend on encountering groundwater within 20 feet bgs at the site.

4.1.11 UST No. 49 (FACNO 49-90)

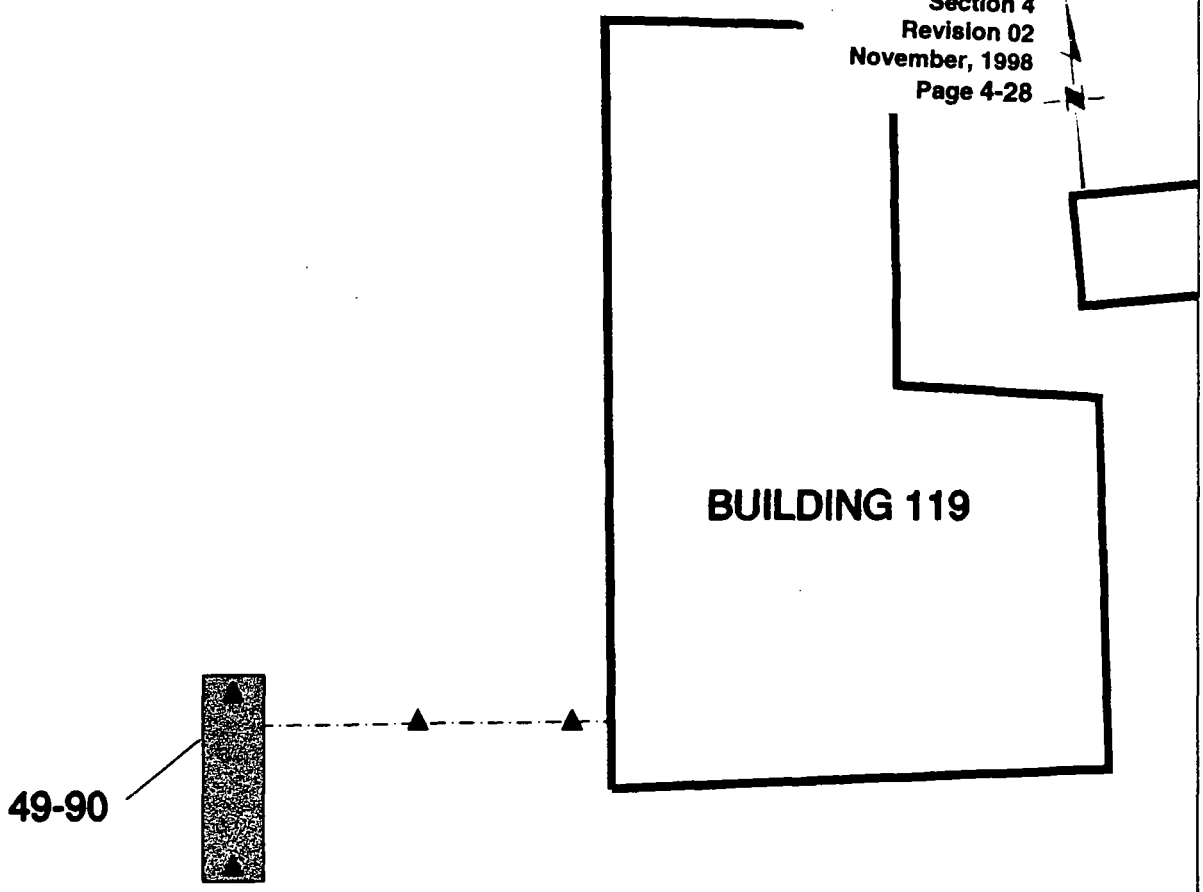
Summary of UST No. 90									
Nearest Facility (FACNO)	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Tank Diameter	Tank Length	Capacity (gallons)	Depth of Tank Bottom (bgs)
49-90	90	West side of Building 110	Aviation Fuel	1952	Removed	8' 0"	26' 10"	10,000	11 feet

Primary Concern: Fuel constituents associated with aviation fuel. PHC were detected in a groundwater sample collected at the site. Oil and grease, benzene, and m-xylene were detected in soil samples collected at the site. Section 3.0 provides detailed information concerning historical analytical data for the UST site.

Disposition of UST Systems: UST No. 90 was removed prior to December 22, 1988. It is unknown if associated piping was removed or remains in place.

Purpose of Sampling: To perform a site check under the BUSTR corrective action program provided in OAC 1301:7-9-13.

Investigative Activities: A geophysical clearance survey will be conducted at the site. As illustrated in Figure 4-11, soil and groundwater samples will be collected from an estimated 4 locations using direct push technology. Continuous sampling will be conducted at each location to a depth of 20 feet bgs, direct push refusal, or groundwater, whichever is encountered first. At each sampling location, soil samples will be field screened and, at a minimum, the soil sample with the highest PID reading will be sent to a laboratory for analysis. If soil samples from a sampling location do not register a PID reading, the soil sample from the bottom of the sampling location (or from immediately above the soil-groundwater interface if groundwater is encountered) will be sent to a laboratory for analysis. In addition to these samples, if groundwater is encountered at a sampling location, a groundwater sample will also be sent to a laboratory for analysis. If groundwater is encountered but a groundwater sample cannot be collected, a soil sample from immediately above the soil-groundwater interface will be sent to a laboratory for analysis.



NOTES:

1. A groundwater sample will only be collected if groundwater is encountered during direct push sampling.

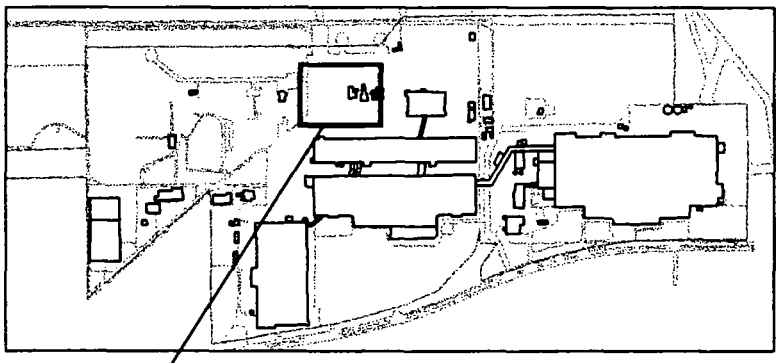
2. Shaded areas and associated piping are under investigation.

Site Boundary

Building

UST Piping

▲ Proposed Direct Push Soil and Groundwater Sampling Location



0 12.5 25 50

Scale in Feet

EARTH TECH

Figure 4-11

UST FACNO 49-90
Sampling Locations

AFP85WP.DWG/*.PLT

Sampling Locations: Sampling locations were selected based on guidance from a BUSTR representative (Reference 322) and on as-built drawings (Reference 313). The methodology for identifying sampling locations is: (1) a sampling location at both ends of former UST No. 90; and (2) a sampling location every 20 feet along the piping run that routinely contained regulated substances. If dispensing units and/or fill pipes are identified during the field investigation (neither are identified on the as-builts), additional sampling locations may be required. Because the USTs have been removed, the as-built drawings are the basis for identifying the sampling locations. Consequently, the proposed sampling locations should be viewed as approximations to the described methodology for sampling locations. These locations may be adjusted based on geophysical survey results and/or other physical features encountered at the site.

Laboratory Analyses: The laboratory analyses required for substances stored in regulated USTs are provided in Table 1 of OAC 1301:7-9-13, presented here as Table 4-1. UST Nos. 90 stored aviation fuel. It is not known if the stored aviation fuel was gasoline or jet fuel. As a consequence, all analyses identified in Table 4-1 for gasoline and middle distillates (i.e. Table 4-1, Analytical Groups 1 and 2) are required. Specifically, the following analyses are required: (1) for soil samples, EPA Methods 8020 (BTEX), 8100 Modified (PAHs), 8015 Modified (TPH), and 418.1 (TPH); and (2) for groundwater samples, EPA Methods 602 (BTEX) and 610 (PAHs).

Number of Samples to be Collected at UST No. 90 (FACNO 49-90)

Sampling Location	Number of Borings/ Holes	Soil[1]	Groundwater[2]
Direct Push Hole	4	4	4

(1) The number of soil samples is approximate. A minimum of one soil sample from each direct push hole will be sent to the laboratory; however, based on PID readings from continuous soil sampling, more than one soil sample may be sent to the laboratory.

(2) The number of groundwater samples will depend on encountering groundwater within 20 feet bgs at the site.

4.1.12 USTs Nos. 161,162,163,164,165, and 274 (FACNOs 124-161,124-162,124-163,124-164,124-165, and 124-274)

Summary of UST Nos. 161, 162, 163, 164, 165, and 274

Nearest Facility (FACNO)	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Tank Diameter	Tank Length	Capacity (gallons)	Depth of Tank Bottom (bgs)
124-161	161	South side of Building 124	Jet Fuel (JP-4)	1954	Removed	5' 6"	12' 0"	2,000	10.75 feet
124-162	162	South side of Building 124	Jet Fuel (JP-4)	1954	Removed	5' 6"	12' 0"	2,000	10.75 feet
124-163	163	South side of Building 124	Jet Fuel (JP-4)	1954	Removed	5' 6"	12' 0"	2,000	10.75 feet
124-164	164	South side of Building 124	Jet Fuel (JP-4)	1954	Removed	5' 6"	12' 0"	2,000	10.75 feet
124-165	165	South side of Building 124	Jet Fuel (JP-4)	1954	Removed	8' 0"	26' 7"	10,000	14 feet

Summary of UST Nos. 161, 162, 163, 164, 165, and 274									
Nearest Facility (FACNO)	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Tank Diameter	Tank Length	Capacity (gallons)	Depth of Tank Bottom (bgs)
124-274	274	South side of Building 124	Jet Fuel (JP-4)	1959	Removed	8' 0"	14' 0"	5,000	12.5 feet

Primary Concern: Fuel constituents associated with JP-4 aviation fuel. PHC were detected in a groundwater sample collected at the site. Benzene, ethyl benzene, m-xylene, and o-xylene were detected in soil samples collected at the site. Section 3.0 provides detailed information concerning historical analytical data for the UST site.

Disposition of UST Systems: UST Nos. 161, 162, 163, 164, 165, and 274 were removed prior to December 22, 1988. It is unknown if associated piping was removed or remains in place.

Purpose of Sampling: To perform a site check under the BUSTR corrective action program provided in OAC 1301:7-9-13.

Investigative Activities: A geophysical clearance survey will be conducted at the site. As illustrated in Figure 4-12, soil and groundwater samples will be collected from an estimated 22 locations using direct push technology. Continuous sampling will be conducted at each location to a depth of 20 feet bgs, direct push refusal, or groundwater, whichever is encountered first. At each sampling location, soil samples will be field screened and, at a minimum, the soil sample with the highest PID reading will be sent to a laboratory for analysis. If soil samples from a sampling location do not register a PID reading, the soil sample from the bottom of the sampling location (or from immediately above the soil-groundwater interface if groundwater is encountered) will be sent to a laboratory for analysis. In addition to soil samples, if groundwater is encountered at a sampling location, a groundwater sample will also be sent to a laboratory for analysis. If groundwater is encountered but a groundwater sample cannot be collected, a soil sample from immediately above the soil-groundwater interface will be sent to a laboratory for analysis.

Sampling Locations: Sampling locations were selected based on guidance from a BUSTR representative (Reference 322) and on as-built drawings (Reference 313). The methodology for identifying sampling locations is: (1) a sampling location at both ends of each former UST; and (2) a sampling location every 20 feet along the piping runs that routinely contained regulated substances. If dispensing units and/or fill pipes are identified during the field investigation (neither are identified on the as-builts), additional sampling locations may be required. Because the USTs have been removed, the as-built drawings are the basis for identifying the sampling locations. Consequently, the proposed sampling locations should be viewed as approximations to the described methodology for sampling locations. These locations may be adjusted based on geophysical survey results and/or other physical features encountered at the site.

BUILDING 124

124-162

124-164

124-274

124-163

ELECTRICAL SUBSTATION

124-161

124-165

NOTES:

1. A groundwater sample will only be collected if groundwater is encountered during direct push sampling.

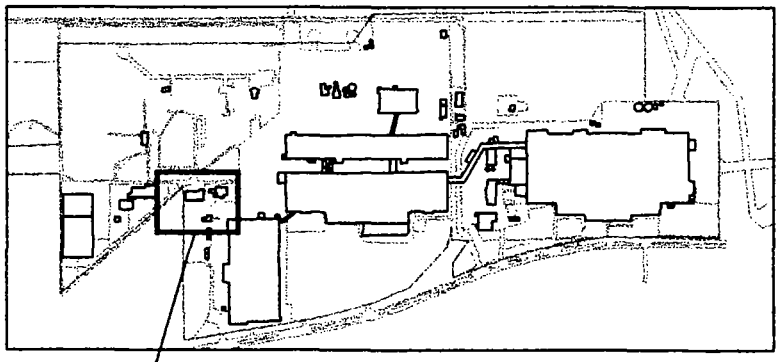
2. Shaded areas and associated piping are under investigation.

Site Boundary

Building

UST Piping

Proposed Direct Push Soil and Groundwater Sampling Location



Area of Interest

0 12.5 25 50

Scale in Feet

EARTH TECH

Figure 4-12

UST FACNOs 124-161, 124-162, 124-163, 124-164, 124-165 and 124-274 Sampling Locations

AFP85WP.DWG/*.PLT

Laboratory Analyses: The laboratory analyses required for substances stored in regulated USTs are provided in Table 1 of OAC 1301:7-9-13, presented here as Table 4-1. UST Nos. 161, 162, 163, 164, 165, and 274 stored JP-4 aviation fuel. Based on Table 4-1, jet fuel is a middle distillate (i.e., Table 4-1, Analytical Group 2) requiring the following analyses: (1) for soil samples, EPA Methods 8020 (BTEX), 8100 Modified (PAHs), and 418.1 (TPH); and (2) for groundwater samples, EPA Methods 602 (BTEX) and 610 (PAHs).

Number of Samples to be Collected at UST Nos. 161, 162, 163, 164, 165, and 274 (FACNOs 124-161, 124-162, 124-163, 124-164, 124-165, and 124-274)

Sampling Location	Number of Borings/ Holes	Soil[1]	Groundwater[2]
Direct Push Hole	22	22	22

(1) The number of soil samples is approximate. A minimum of one soil sample from each direct push hole will be sent to the laboratory; however, based on PID readings from continuous soil sampling, more than one soil sample may be sent to the laboratory.
(2) The number of groundwater samples will depend on encountering groundwater within 20 feet bgs at the site.

4.1.13 UST No. 166 (FACNO 125-166)

Summary of UST No. 166

Nearest Facility (FACNO)	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Tank Diameter	Tank Length	Capacity (gallons)	Depth of Tank Bottom (bgs)
125-166	166	South side of Building 125	Waste oil	1956	Removed	8' 0"	27' 0"	10,000	11 feet

Primary Concern: Waste oil. PHC were detected in a groundwater sample collected at the site. No constituents were quantified above detection limits in samples collected from the excavation pit. PHC, VOCs, and Aroclor 1260 were detected in a solid sample from drums associated with the UST excavation. Section 3.0 provides detailed information concerning historical analytical data for the UST site.

Disposition of UST Systems: UST No. 166 was removed prior to December 22, 1988. It is unknown if associated piping was removed or remains in place.

Purpose of Sampling: To perform a site check under the BUSTR corrective action program provided in OAC 1301:7-9-13.

Investigative Activities: A geophysical clearance survey will be conducted at the site. As illustrated in Figure 4-13, soil and groundwater samples will be collected from an estimated 2 locations using direct push technology. Continuous sampling will be conducted at each location to a depth of 20 feet bgs, direct push refusal, or groundwater, whichever is encountered first. At each sampling location, soil samples will be field screened and, at a minimum, the soil sample with the highest PID reading will be sent to a laboratory for analysis. If soil samples from a sampling location do not register a PID reading, the soil sample from the bottom of the sampling location (or from immediately above the soil-groundwater interface if groundwater is

BUILDING 125

125-166

NOTES:

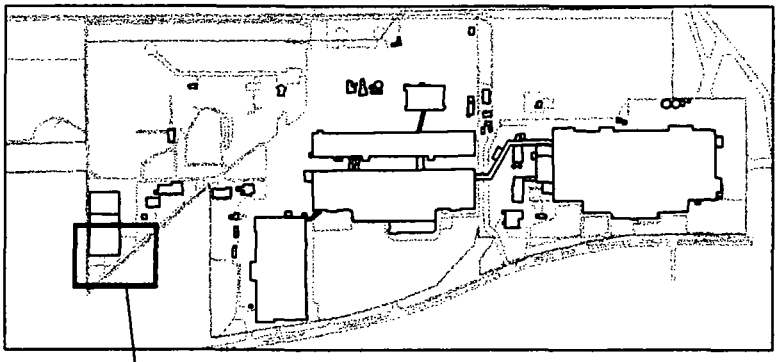
1. A groundwater sample will only be collected if groundwater is encountered during direct push sampling.
2. Shaded areas and associated piping are under investigation.

Site Boundary

Building

UST Piping

▲ Proposed Direct Push Soil and Groundwater Sampling Location



Area of Interest

0 12.5 25 50

Scale in Feet

EARTH TECH

Figure 4-13

UST FACNO 125-166
Sampling Locations

AFP85WP.DWG/*.PLT

encountered) will be sent to a laboratory for analysis. In addition to soil samples, if groundwater is encountered at a sampling location, a groundwater sample will also be sent to a laboratory for analysis. If groundwater is encountered but a groundwater sample cannot be collected, a soil sample from immediately above the soil-groundwater interface will be sent to a laboratory for analysis.

Sampling Locations: Sampling locations were selected based on guidance from a BUSTR representative (Reference 322) and on as-built drawings (Reference 313). The methodology for identifying sampling locations is: (1) a sampling location at both ends of former UST No. 166. If dispensing units and/or fill pipes are identified during the field investigation (neither are identified on the as-builts), additional sampling locations may be required. Because the USTs have been removed, the as-built drawings are the basis for identifying the sampling locations. Consequently, the proposed sampling locations should be viewed as approximations to the described methodology for sampling locations. These locations may be adjusted based on geophysical survey results and/or other physical features encountered at the site.

Laboratory Analyses: The laboratory analyses required for substances stored in regulated USTs are provided in Table 1 of OAC 1301:7-9-13, presented here as Table 4-1. UST No. 166 stored waste oil. Based on Table 4-1, waste oil (i.e. Table 4-1, Analytical Group 3) requires the following analyses: (1) for soil samples, EPA Methods 8240 (VOCs) and 418.1 (TPH); and (2) for groundwater samples, EPA Methods 624 (VOCs). In addition to these analyses, because Aroclor 1260 was detected in soil samples collected from drums associated with the UST excavation, EPA Method 8082 (PCBs) will be required for soil and groundwater samples.

Number of Samples to be Collected at UST No. 166 (FACNOs 125-166)

Sampling Location	Number of Borings/ Holes	Soil[1]	Groundwater[2]
Direct Push Hole	2	2	2

(1) The number of soil samples is approximate. A minimum of one soil sample from each direct push hole will be sent to the laboratory; however, based on PID readings from continuous soil sampling, more than one soil sample may be sent to the laboratory.
(2) The number of groundwater samples will depend on encountering groundwater within 20 feet bgs at the site.

4.1.14 UST Nos. 109, 110, 111, and 215 (FACNO 141-109, 141-110, 141-111, 141-215)

Summary of UST Nos. 109, 110, 111, and 215

Nearest Facility (FACNO)	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Tank Diameter	Tank Length	Capacity (gallons)	Depth of Tank Bottom (bgs)
141-109	109	West of Building 141	Jet Fuel (JP-5)	1956	Removed	10' 6"	23' 2"	15,000	--
141-110	110	West of Building 141	Jet Fuel (JP-5)	1956	Removed	10' 6"	23' 2"	15,000	--
141-111	111	West of Building 141	Jet Fuel (JP-5)	1956	Removed	10' 6"	23' 2"	15,000	--
141-215	215	West of Building 141	Jet Fuel (JP-5)	1953	Removed	10' 6"	23' 2"	15,000	--

Primary Concern: Fuel constituents associated with JP-5 aviation fuel. PHC, toluene, and phenols were detected in samples collected from excavation pile. Oil and grease was detected in samples collected from excavation pit. Section 3.0 provides detailed information concerning historical analytical data for the UST site.

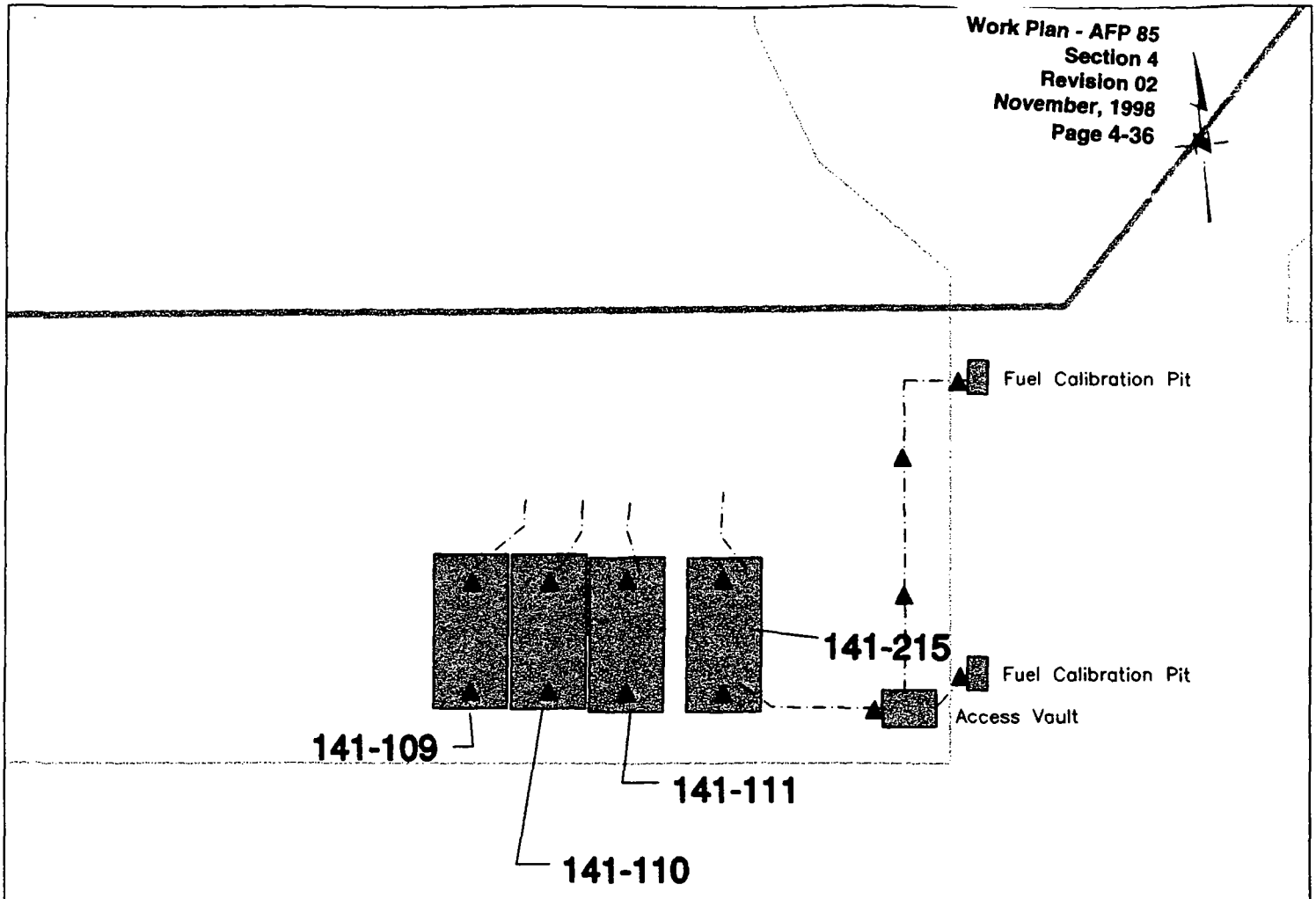
Disposition of UST Systems: UST Nos. 109, 110, 111, and 215 were removed prior to December 22, 1988. It is unknown if associated piping was removed or remains in place.

Purpose of Sampling: To perform a site check under the BUSTR corrective action program provided in OAC 1301:7-9-13.

Investigative Activities: A geophysical clearance survey will be conducted at the site. As illustrated in Figure 4-14, soil and groundwater samples will be collected from an estimated 13 locations using direct push technology. Continuous sampling will be conducted at each location to a depth of 20 feet bgs, direct push refusal, or groundwater, whichever is encountered first. At each sampling location, soil samples will be field screened and, at a minimum, the soil sample with the highest PID reading will be sent to a laboratory for analysis. If soil samples from a sampling location do not register a PID reading, the soil sample from the bottom of the sampling location (or from immediately above the soil-groundwater interface if groundwater is encountered) will be sent to a laboratory for analysis. In addition to soil samples, if groundwater is encountered at a sampling location, a groundwater sample will also be sent to a laboratory for analysis. If groundwater is encountered but a groundwater sample cannot be collected, a soil sample from immediately above the soil-groundwater interface will be sent to a laboratory for analysis.

Sampling Locations: Sampling locations were selected based on guidance from a BUSTR representative (Reference 322) and on as-built drawings (Reference 313). The methodology for identifying sampling locations is: (1) a sampling location at both ends of the former USTs; and (2) a sampling location every 20 feet along the piping runs that routinely contained regulated substances. If dispensing units and/or fill pipes are identified during the field investigation (neither are identified on the as-builts), additional sampling locations may be required. Because the USTs have been removed, the as-built drawings are the basis for identifying the sampling locations. Consequently, the proposed sampling locations should be viewed as approximations to the described methodology for sampling locations. These locations may be adjusted based on geophysical survey results and/or other physical features encountered at the site.

Laboratory Analyses: The laboratory analyses required for substances stored in regulated USTs are provided in Table 1 of OAC 1301:7-9-13, presented here as Table 4-1. UST Nos. 109, 110, 111, and 215 stored JP-5 aviation fuel. Based on Table 4-1, JP-5 is a middle distillate (i.e. Table 4-1, Analytical Group 2) requiring the following analyses: (1) for soil samples, EPA Methods 8020 (BTEX), 8100 Modified (PAHs), and 418.1 (TPH); and (2) for groundwater samples, EPA Methods 602 (BTEX), and 610 (PAHs).



NOTES:

1. A groundwater sample will only be collected if groundwater is encountered during direct push sampling.

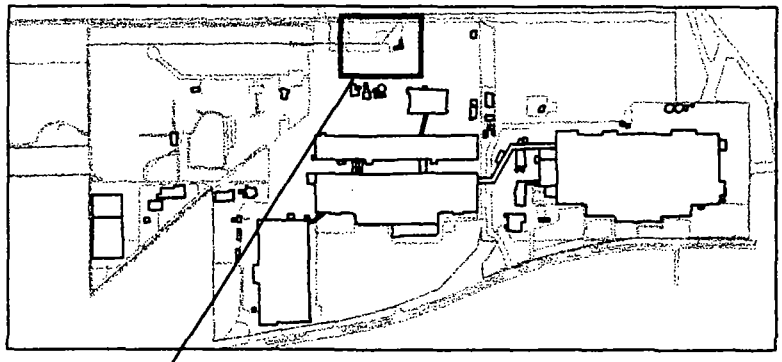
2. Shaded areas and associated piping are under investigation.

Site Boundary

Building

UST Piping

▲ Proposed Direct Push Soil and Groundwater Sampling Location



0 12.5 25 50

Scale in Feet

EARTH TECH

Figure 4-14

UST FACNOs 141-109, 141-110, 141-111, and 141-215 Sampling Locations

AFP85WP.DWG/*.PLT

Number of Samples to be Collected at UST Nos. 109, 110, 111, and 215 (FACNOs 141-109, 141-110, 141-111, and 141-215)			
Sampling Location	Number of Borings/ Holes	Soil[1]	Groundwater[2]
Direct Push Hole	13	13	13

(1) The number of soil samples is approximate. A minimum of one soil sample from each direct push hole will be sent to the laboratory; however, based on PID readings from continuous soil sampling, more than one soil sample may be sent to the laboratory.
(2) The number of groundwater samples will depend on encountering groundwater within 20 feet bgs at the site.

4.1.15 UST No. 297 (FACNO 141-297)

Summary of UST No. 297									
Nearest Facility (FACNO)	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Tank Diameter	Tank Length	Capacity (gallons)	Depth of Tank Bottom (bgs)
141-297	297	North of Building 141	Jet Fuel (JP-4)	1968	Removed	ND	ND	1,500	--

Primary Concern: Fuel constituents associated with JP-4 aviation fuel. Oil and grease was detected in samples collected from the east wall of the excavation pit and from an excavation soil pile. Section 3.0 provides detailed information concerning historical analytical data for the UST site.

Disposition of UST Systems: UST No. 297 were removed prior to December 22, 1988. It is unknown if associated piping was removed or remains in place.

Purpose of Sampling: To perform a site check under the BUSTR corrective action program provided in OAC 1301:7-9-13.

Investigative Activities: A geophysical clearance survey will be conducted at the site. As illustrated in Figure 4-15, soil and groundwater samples will be collected from an estimated 2 locations using direct push technology. Continuous sampling will be conducted at each location to a depth of 20 feet bgs, direct push refusal, or groundwater, whichever is encountered first. At each sampling location, soil samples will be field screened and, at a minimum, the soil sample with the highest PID reading will be sent to a laboratory for analysis. If soil samples from a sampling location do not register a PID reading, the soil sample from the bottom of the sampling location (or from immediately above the soil-groundwater interface if groundwater is encountered) will be sent to a laboratory for analysis. In addition to soil samples, if groundwater is encountered at a sampling location, a groundwater sample will also be sent to a laboratory for analysis. If groundwater is encountered but a groundwater sample cannot be collected, a soil sample from immediately above the soil-groundwater interface will be sent to a laboratory for analysis.

Sampling Locations: Sampling locations were selected based on guidance from a BUSTR representative (Reference 322) and on as-built drawings (Reference 313). The methodology for identifying sampling locations is: (1) a sampling location at both ends of former UST No. 297. If dispensing units and/or fill pipes are identified during the field investigation (neither are

141-297

BUILDING 141

NOTES:

1. A groundwater sample will only be collected if groundwater is encountered during direct push sampling.

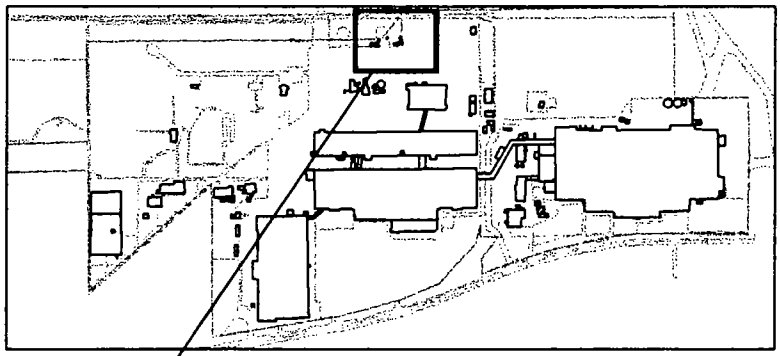
2. Shaded areas and associated piping are under investigation.

Site Boundary

Building

UST Piping

▲ Proposed Direct Push Soil and Groundwater Sampling Location



Area of Interest

0 10 20 40

Scale in Feet

EARTH TECH

Figure 4-15

UST FACNO 141-297
Sampling Locations

AFP85WP.DWG/*.PLT

identified on the as-builts), additional sampling locations may be required. Because the USTs have been removed, the as-built drawings are the basis for identifying the sampling locations. Consequently, the proposed sampling locations should be viewed as approximations to the described methodology for sampling locations. These locations may be adjusted based on geophysical survey results and/or other physical features encountered at the site.

Laboratory Analyses: The laboratory analyses required for substances stored in regulated USTs are provided in Table 1 of OAC 1301:7-9-13, presented here as Table 4-1. UST No. 297 stored JP-4 aviation fuel. Based on Table 4-1, JP-4 aviation fuel is a middle distillate (i.e., Table 4-1, Analytical Group 2) requiring the following analyses: (1) for soil samples, EPA Methods 8020 (BTEX), 8100 Modified (PAHs), and 418.1 (TPH); and (2) for groundwater samples, EPA Methods 602 (BTEX), and 610 (PAHs).

Number of Samples to be Collected at UST No. 297 (FACNO 141-297)

Sampling Location	Number of Borings/ Holes	Soil[1]	Groundwater[2]
Direct Push Hole	2	2	2

(1) The number of soil samples is approximate. A minimum of one soil sample from each direct push hole will be sent to the laboratory; however, based on PID readings from continuous soil sampling, more than one soil sample may be sent to the laboratory.
(2) The number of groundwater samples will depend on encountering groundwater within 20 feet bgs at the site.

4.1.16 UST Nos. 239 and 240 (FACNO 214-239 and 214-240)

Summary of UST Nos. 239 and 240

Nearest Facility (FACNO)	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Tank Diameter	Tank Length	Capacity (gallons)	Depth of Tank Bottom (bgs)
214-239	239	South side of Building 214	Jet Fuel (JP-4)	1957	Removed	8' 0"	27' 6"	10,000	12.5 feet
214-240	240	South side of Building 214	Jet Fuel (JP-4)	1957	Removed	8' 0"	27' 6"	10,000	12.5 feet

Primary Concern: Fuel constituents associated with JP-4 aviation fuel. Oil and grease, m-xylene, and benzene were detected in samples collected in excavation pit. o-xylene was detected in samples collected from excavated soil. Section 3.0 provides detailed information concerning historical analytical data for the UST site.

Disposition of UST Systems: UST Nos. 239 and 240 were removed prior to December 22, 1988. It is unknown if associated piping was removed or remains in place.

Purpose of Sampling: To perform a site check under the BUSTR corrective action program provided in OAC 1301:7-9-13.

Investigative Activities: A geophysical clearance survey will be conducted at the site. As illustrated in Figure 4-16, soil and groundwater samples will be collected from an estimated 7

locations using direct push technology. Continuous sampling will be conducted at each location to a depth of 20 feet bgs, direct push refusal, or groundwater, whichever is encountered first. At each sampling location, soil samples will be field screened and, at a minimum, the soil sample with the highest PID reading will be sent to a laboratory for analysis. If soil samples from a sampling location do not register a PID reading, the soil sample from the bottom of the sampling location (or from immediately above the soil-groundwater interface if groundwater is encountered) will be sent to a laboratory for analysis. If groundwater is encountered at a sampling location, a groundwater sample will also be sent to the laboratory for analysis. If groundwater is encountered but a groundwater sample cannot be collected, a soil sample from immediately above the soil-groundwater interface will be sent to the laboratory for analysis.

Sampling Locations: Sampling locations were selected based on guidance from a BUSTR representative (Reference 322) and on as-built drawings (Reference 313). The methodology for identifying sampling locations is: (1) a sampling location at both ends former UST Nos. 239 and 240; and (2) a sampling location every 20 feet along the piping runs that routinely contained regulated substances. If dispensing units and/or fill pipes are identified during the field investigation (neither are identified on the as-builts), additional sampling locations may be required. Because the USTs have been removed, the as-built drawings are the basis for identifying the sampling locations. Consequently, the proposed sampling locations should be viewed as approximations to the described methodology for sampling locations. These locations may be adjusted based on geophysical survey results and/or other physical features encountered at the site.

Laboratory Analyses: The laboratory analyses required for substances stored in regulated USTs are provided in Table 1 of OAC 1301:7-9-13, presented here as Table 4-1. UST Nos. 239 and 240 stored JP-4 aviation fuel. Based on Table 4-1, JP-4 aviation fuel is a middle distillate (i.e., Table 4-1, Analytical Group 2) requiring the following analyses: (1) for soil samples, EPA Methods 8020 (BTEX), 8100 Modified (PAHs), and 418.1 (TPH); and (2) for groundwater samples, EPA Methods 602 (BTEX), and 610 (PAHs).

Number of Samples to be Collected at UST Nos. 239 and 240 (FACNOs 214-239 and 214-240)

Sampling Location	Number of Borings/ Holes	Soil[1]	Groundwater[2]
Direct Push Hole	7	7	7

(1) The number of soil samples is approximate. A minimum of one soil sample from each direct push hole will be sent to the laboratory; however, based on PID readings from continuous soil sampling, more than one soil sample may be sent to the laboratory.
(2) The number of groundwater samples will depend on encountering groundwater within 20 feet bgs at the site.

BUILDING 214

214-240

214-239

NOTES:

1. A groundwater sample will only be collected if groundwater is encountered during direct push sampling.

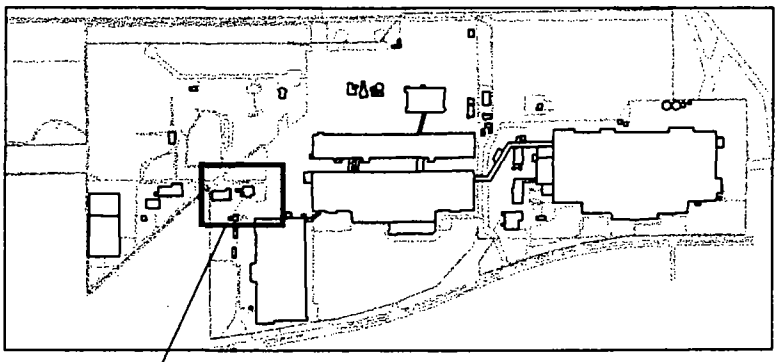
2. Shaded areas and associated piping are under investigation.

Site Boundary

Building

UST Piping

▲ Proposed Direct Push Soil and Groundwater Sampling Location



Area of Interest

0 12.5 25 50

Scale in Feet

EARTH TECH

Figure 4-16

UST FACNOs 214-239 and 214-240 Sampling Locations

4.1.17 UST No. 96 (FACNO 404-96)

Summary of UST No. 96									
Nearest Facility (FACNO)	Tank Number	Location	Substance Stored	Approximate Installation Date	Removal Status	Tank Diameter	Tank Length	Capacity (gallons)	Depth of Tank Bottom (bgs)
404-96	96	West side of Building 404	Lubricating oil	1941	Inactive (filled with concrete)	ND	ND	15,000	11 feet

Primary Concern: Lubricating oil. TPH, benzene, toluene, ethyl benzene, and o-xylene were detected in soil samples collected from five borings advanced around the perimeter of the UST. Section 3.0 provides detailed information concerning historical analytical data for the UST site.

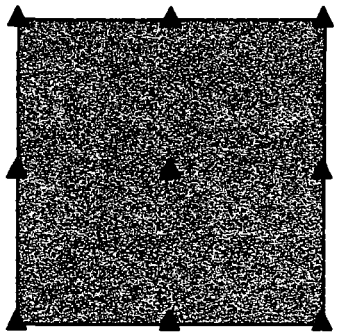
Disposition of UST Systems: UST No. 96 was left in place and filled with concrete prior to December 22, 1988. It is unknown if associated piping was removed or remains in place.

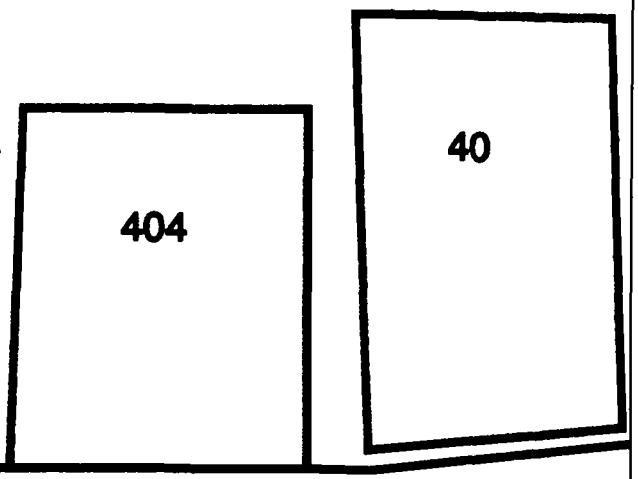
Purpose of Sampling: To perform a site check under the BUSTR corrective action program provided in OAC 1301:7-9-13.

Investigative Activities: A geophysical clearance survey will be conducted at the site. As illustrated in Figure 4-17, soil and groundwater samples will be collected from an estimated 9 locations using direct push technology. Continuous sampling will be conducted at each location to a depth of 20 feet bgs, direct push refusal, or groundwater, whichever is encountered first. At each sampling location, soil samples will be field screened and, at a minimum, the soil sample with the highest PID reading will be sent to a laboratory for analysis. If soil samples from a sampling location do not register a PID reading, the soil sample from the bottom of the sampling location (or from immediately above the soil-groundwater interface if groundwater is encountered) will be sent to a laboratory for analysis.

Sampling Locations: As-built drawings for UST No. 96 were not identified during the records search for this Work Plan. Consequently, the BUSTR-suggested methodology for sampling locations (described in subsection 2.1.1) was not feasible for this site. Instead, a grid approach will be used to determine the sampling locations. These locations may be adjusted based on geophysical survey results and/or other physical features encountered at the site.

Laboratory Analyses: The laboratory analyses required for substances stored in regulated USTs are provided in Table 1 of OAC 1301:7-9-13, presented here as Table 4-1. UST No. 96 stored lubricating oil. Based on Table 4-1, lubricating oil (i.e., Table 4-1, Analytical Group 4) requires the following analyses: (1) for soil samples, EPA Method 418.1 (TPH); and (2) for groundwater, no analyses are required by BUSTR.





COVERED PASSAGEWAY

NOTES:

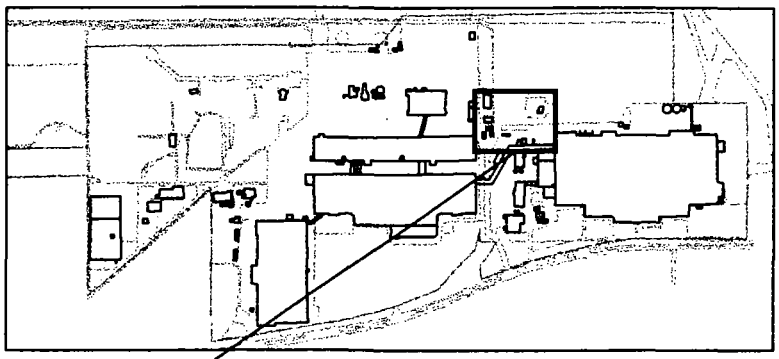
1. Shaded area is under investigation; soil borings will be installed along a grid because the exact location of the UST is unknown (no "as-built" is available).

Site Boundary

Building

UST Piping

▲ Proposed Direct Push Soil and Groundwater Sampling Location



Area of Interest

0 12.5 25 50

Scale in Feet

EARTH TECH

Figure 4-17

UST FACNO 404-96
Sampling Locations

AFP85WP.DWG/*.PLT

Number of Samples to be Collected at UST No. 96 (FACNO 404-96)			
Sampling Location	Number of Borings/ Holes	Soil[1]	Groundwater
Direct Push Hole	9	9	0

(1) The number of soil samples is approximate. A minimum of one soil sample from each direct push hole will be sent to the laboratory; however, based on PID readings from continuous soil sampling, more than one soil sample may be sent to the laboratory.

4.2 PCB Sites

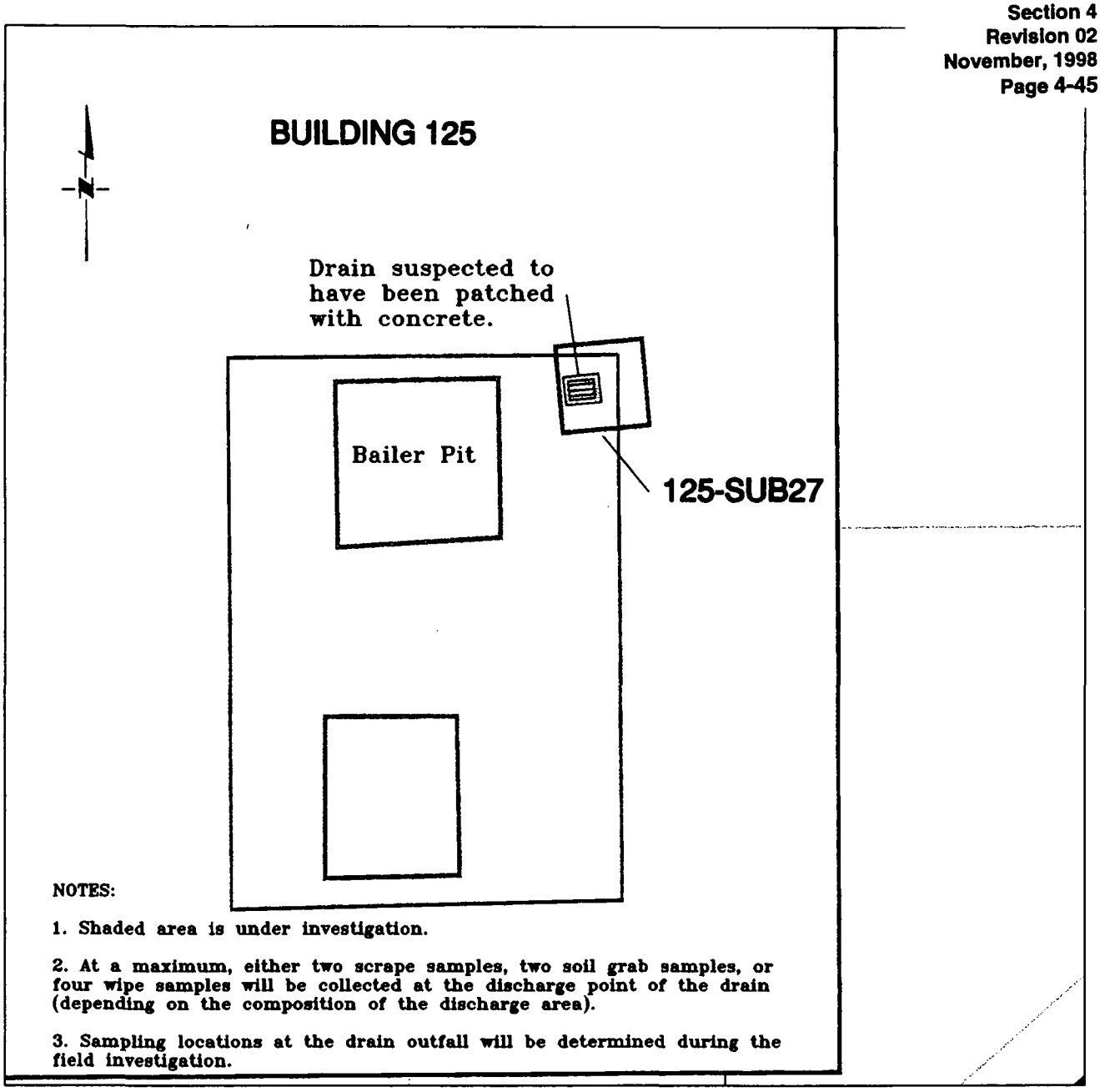
This section describes the type and number of samples to be collected, analytical methods, and the rationale for sampling activities for each of the VAP-ineligible PCB sites described in Section 3.3, with the exception of sites that have been completely remediated since the EBS Addendum (Reference 267) and the Phase II Property Assessment SOW were completed (Reference 308). IRP Site 3 - PCB Spill Site (FACNO IRP-3) and transformer vault 72 (FACNO 3-TV72) have been closed under the appropriate regulatory program. The following subsections describe work to be performed at the remaining 7 PCB sites that have not been closed under the TSCA.

4.2.1 Substation 27 (FACNO 125-SUB27)

Primary Concern: Transformers and associated equipment at Substation 27 have been removed. In 1997, the substation area was cleaned such that the remaining concrete contained PCB concentrations below regulatory action levels. The drain was never cleaned or investigated further. It is unknown whether the drain leads to a sanitary sewer line, to a storm sewer line, to an industrial sewer line (i.e., to the on-site treatment plant), to some discharge point outside of the building, or directly to the subsurface soil.

This drain could not be located during the most recent site visit (May, 1998) (Reference 310). It is suspected to have been covered with concrete. The building currently contains steel racking that is bolted into the concrete floor in the area of the former substation.

Investigative Activities: Once the ultimate discharge point is determined through use of a smoke test or review of any applicable drawings, wipe samples will be collected from the discharge point. The number and type of samples to be collected will depend on the discharge point. For example, if piping from the drain leads to pipe that discharges to a lined ditch or paved area, a wipe sample will be collected from the end of the pipe and one or two wipe samples will be collected from the lined ditch or paved area. If the ultimate discharge point is an unlined ditch, surface scrape samples will be collected. If the drain leads directly to the subsurface soil, a grab sample of the subsurface soil will be collected at the end of the pipe. The table below shows the maximum number of samples that are anticipated to be collected. Proposed sampling locations and methods are shown in Figure 4-18.



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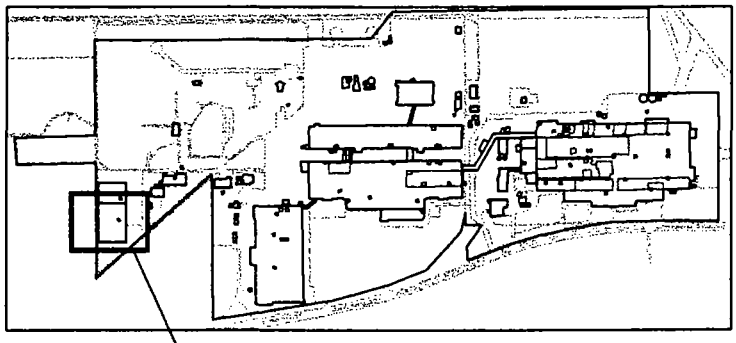


Site Boundary

Building

Proposed Surface Scrape Sampling Location

Proposed Wipe Sampling Location

Proposed Soil Grab Sampling Location

Area of Interest

0 22.5 45 90

Scale in Feet

VAP-SHEL_DWG/T.PLT

EARTH TECH

Figure 4-18

Transformer Vault
FACNO 125-SUB27
Sampling locations

Rationale: The results of the investigation will help determine whether drain flushing, excavation, encapsulation, or other remedial actions will be required.

Maximum Number of Samples to be Collected at Substation 27*

Sampling Point	Soil[1]	Other[2]
Grab Samples	2	--
Wipe Samples	--	4
Surface Scrape Samples	2	--

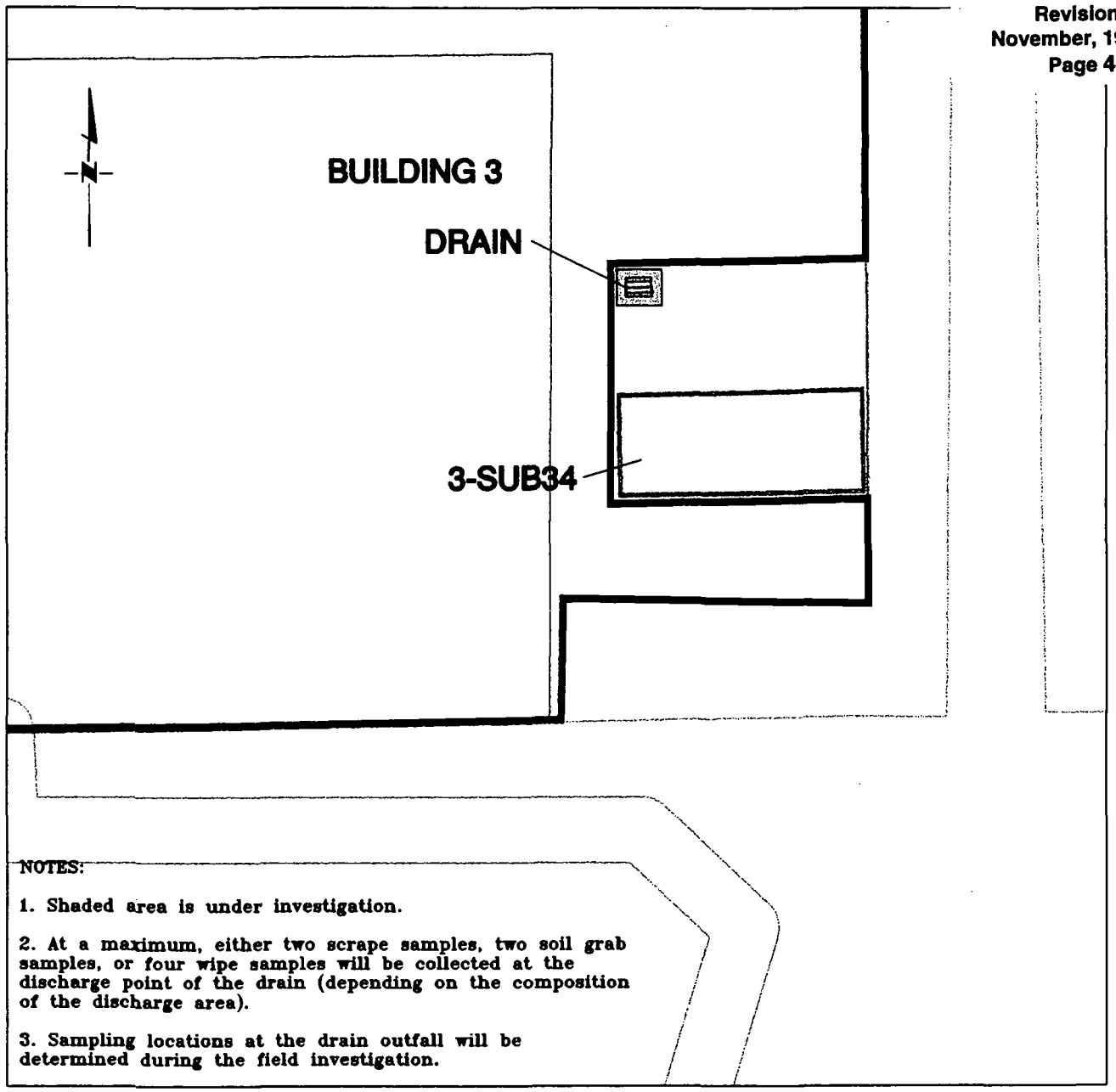
*Sample type dependent on discharge point construction.
(1) Analytical Methods for Soil Samples: EPA Method 8082 (PCBs).
(2) Analytical Methods for Wipe Samples: EPA Method 8082 (PCBs).

4.2.2 Substation 34 (FACNO 3-SUB34)

Primary Concern: Transformers and associated equipment at Substation 34 have been removed. In 1997, the substation area was cleaned such that the concrete contained PCB concentrations below regulatory action levels. During the cleanup, PCBs were detected in a wipe sample collected from the drain at a concentration of 14,000 µg/100 cm^2 (Reference 270). The drain was never cleaned or investigated further. It is unknown whether the drain leads to a sanitary sewer line, to a storm sewer line, to an industrial sewer line (i.e., to the on-site treatment plant), to some discharge point outside of the building, or directly to the subsurface soil.

Investigative Activities: Because an accurate utility map showing piping from the drain is not available, a smoke test will be conducted to determine where the drain leads. Other inlets and outfalls in the area will be observed to determine the path and ultimate discharge point. If the discharge point cannot be determined during the smoke test, a sewer-type "snake" will be placed in the drain, and will be forced through the pipe. Once the ultimate discharge point is determined, wipe samples will be collected from the discharge point. The number and type of samples to be collected will depend on the discharge point. For example, if piping from the drain discharges to a lined ditch or paved area, a wipe sample will be collected from the end of the pipe and one or two wipe samples will be collected from the lined ditch or paved area. If the ultimate discharge point is an unlined ditch, surface scrape samples will be collected. If the drain leads directly to the subsurface soil, a grab sample of the subsurface soil will be collected at the end of the pipe. The table below shows the maximum number of samples that are anticipated to be collected. Proposed sampling locations and methods are shown in Figure 4-19.

Rationale: The results of the investigation will help regulatory authorities determine whether drain flushing, excavation, encapsulation, or other remedial actions will be required.



NOTES:

1. Shaded area is under investigation.

2. At a maximum, either two scrape samples, two soil grab samples, or four wipe samples will be collected at the discharge point of the drain (depending on the composition of the discharge area).

3. Sampling locations at the drain outfall will be determined during the field investigation.

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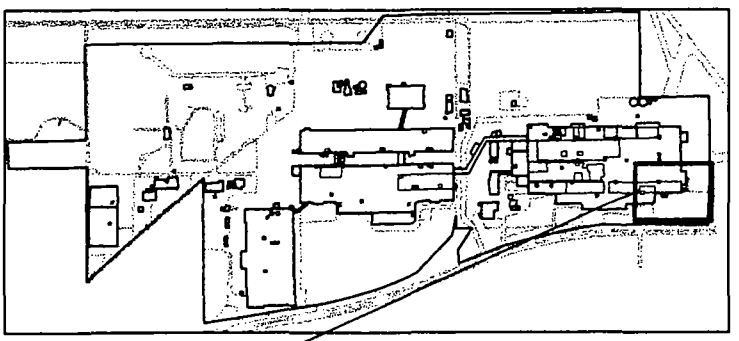
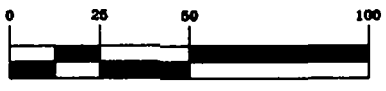


Area of Interest

- Site Boundary
- Building
- Proposed Surface Scrape Sampling Location
- Proposed Wipe Sampling Location
- Proposed Soil Grab Sampling Location



VAP-SHELDWG/T.PLT

EARTH TECH

Figure 4-19

Transformer Vault FACNO 3-SUB34
Sampling locations

Maximum Number of Samples to be Collected at Substation 34*

Sampling Point	Soil[1]	Other[2]
Grab Samples	2	--
Wipe Samples	--	4
Surface Scrape Samples	2	--

*Sample type dependent on discharge point construction.
(1) Analytical Methods for Soil Samples: EPA Method 8082 (PCBs).
(2) Analytical Methods for Wipe Samples: EPA Method 8082 (PCBs).

4.2.3 Transformer Vault 17 (FACNO 7-TV17)

Primary Concern: The transformer at TV17 has been removed. In 1997, the area was cleaned to below regulatory action levels. Leaks at the fins and drain were observed prior to cleaning. The drain was never cleaned or investigated further. It is unknown whether the drain leads to a sanitary sewer line, to a storm sewer line, to an industrial sewer line (i.e., to the on-site treatment plant), to some discharge point outside of the building, or directly to the subsurface soil.

Investigative Activities: Because an accurate utility map showing piping from the drain is not available, a smoke test will be conducted to determine where the drain leads. Other inlets and outfalls in the area will be observed to determine the path and ultimate discharge point. If the discharge point cannot be determined during the smoke test, a sewer-type "snake" will be placed in the drain, and forced through the pipe. Once the ultimate discharge point is determined, wipe samples will be collected from the discharge point. The number and type of samples to be collected will depend on the discharge point. For example, if piping from the drain discharges to a lined ditch or paved area, a wipe sample will be collected from the end of the pipe and one or two wipe samples will be collected from the lined ditch or paved area. If the ultimate discharge point is an unlined ditch, surface scrape samples will be collected. If the drain leads directly to the subsurface soil, a grab sample of the subsurface soil will be collected at the end of the pipe. The table below shows the maximum number of samples that are anticipated to be collected. Proposed sampling locations and methods are shown in Figure 4-20.

Rationale: The results of the investigation will help regulatory authorities determine whether drain flushing, excavation, encapsulation, or other remedial actions will be required.

BUILDING 7

DRAIN

7-TV17

NOTES:

1. Shaded area is under investigation.

2. At a maximum, either two scrape samples, two soil grab samples, or four wipe samples will be collected at the discharge point of the drain (depending on the composition of the discharge area).

3. Sampling locations at the drain outfall will be determined during the field investigation.

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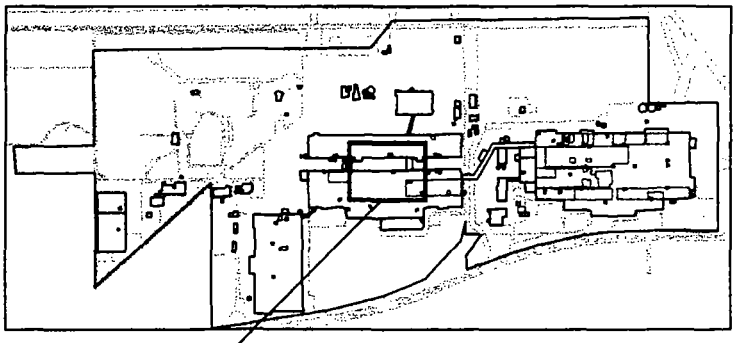


Area of Interest

Site Boundary

Building

Proposed Surface Scrape Sampling Location

Proposed Wipe Sampling Location

Proposed Soil Grab Sampling Location

0 25 50 100

Scale in Feet

VAP-SHELDWG/7.PLT

EARTH TECH

Figure 4-20

Transformer Vault FACNO 7-TV17
Sampling locations

Maximum Number of Samples to be Collected at Substation 17*

Sampling Point	Soil[1]	Other[2]
Grab Samples	2	--
Wipe Samples	--	4
Surface Scrape Samples	2	--

*Sample type dependent on discharge point construction.
(1) Analytical Methods for Soil Samples: EPA Method 8082 (PCBs).
(2) Analytical Methods for Wipe Samples: EPA Method 8082 (PCBs).

4.2.4 Transformer Vault 18 (FACNO 7-TV18)

Primary Concern: The transformer at TV18 has been removed. In 1997, the area was cleaned to below regulatory action levels. During the cleanup, PCBs were detected in a wipe sample collected from the drain at a concentration of 28,000 mg/100 cm^2 (Reference 270). The drain was never cleaned or investigated further. It is unknown whether the drain leads to a sanitary sewer line, to a storm sewer line, to an industrial sewer line (i.e., to the on-site treatment plant), to some discharge point outside of the building, or directly to the subsurface soil.

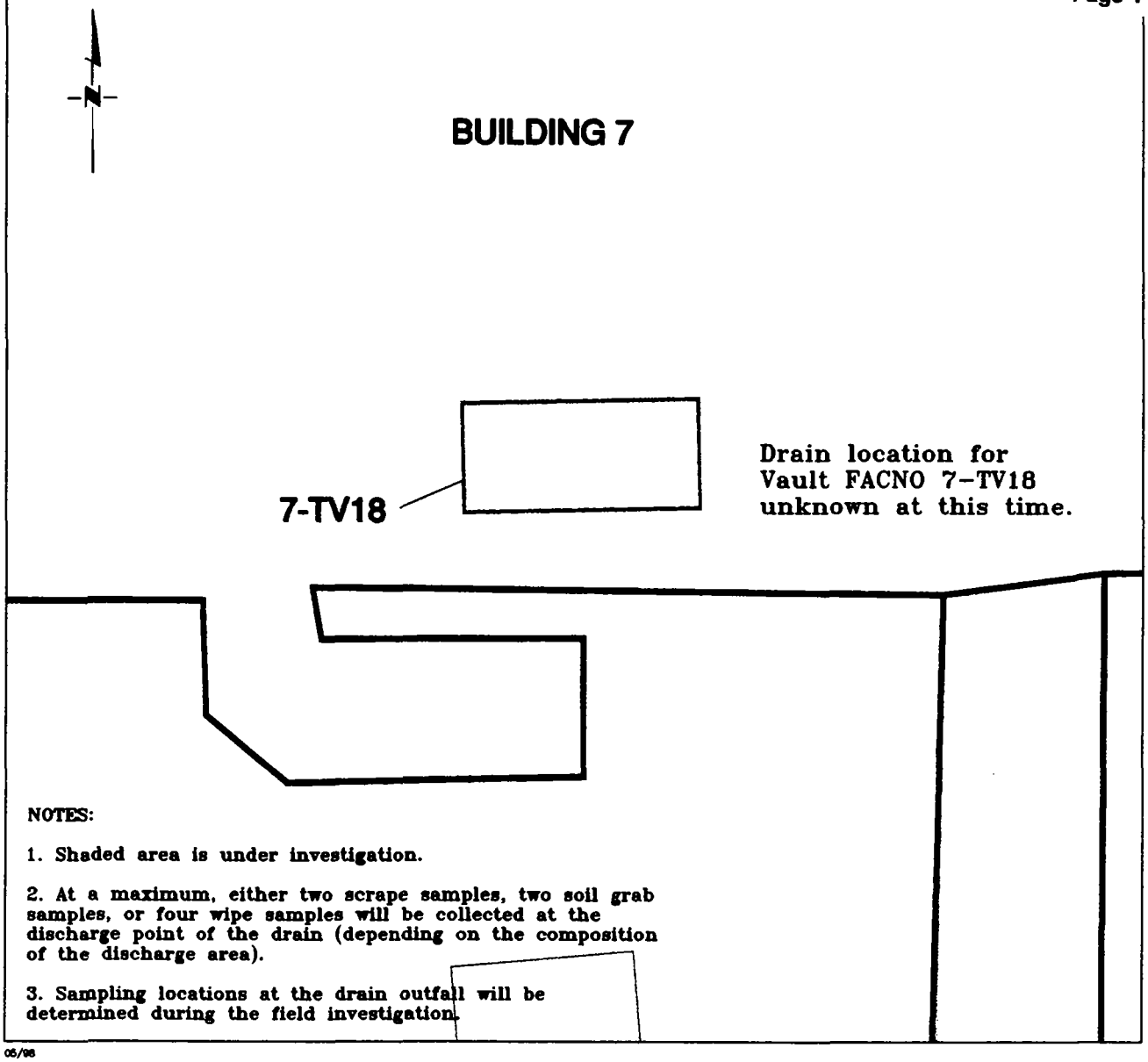
Investigative Activities: Because an accurate utility map showing piping from the drain is not available, a smoke test will be conducted to determine where the drain leads. Other inlets and outfalls in the area will be observed to determine the path and ultimate discharge point. If the discharge point cannot be determined during the smoke test, a sewer-type "snake" will be placed in the drain, and forced through the pipe. Once the ultimate discharge point is determined, wipe samples will be collected from the discharge point. The number and type of samples to be collected will depend on the discharge point. For example, if the drain leads to pipe that discharges to a lined ditch or paved area, a wipe sample will be collected from the end of the pipe and one or two wipe samples will be collected from the lined ditch or paved area. If the ultimate discharge point is an unlined ditch, surface scrape samples will be collected. If the drain leads directly to the subsurface soil, a grab sample of the subsurface soil will be collected at the end of the pipe. The table below shows the maximum number of samples that are anticipated to be collected. Proposed sampling locations and methods are shown in Figure 4-21.

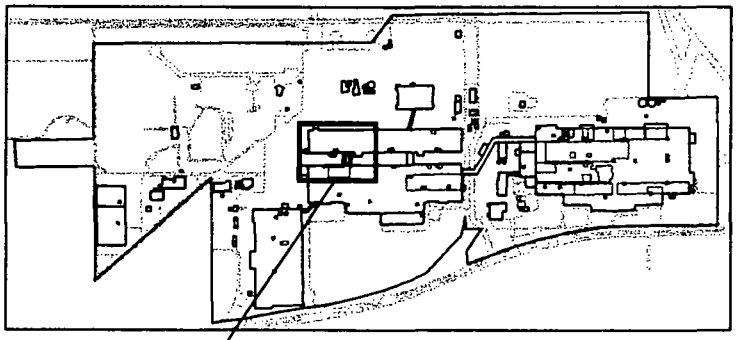
Rationale: The results of the investigation will help regulatory authorities determine whether drain flushing, excavation, encapsulation, or other remedial actions will be required.

Maximum Number of Samples to be Collected at Transformer Vault 18*

Sampling Point	Soil[1]	Other[2]
Grab Samples	2	--
Wipe Samples	--	4
Surface Scrape Samples	2	--

*Sample type dependent on discharge point construction.
(1) Analytical Methods for Soil Samples: EPA Method 8082 (PCBs).
(2) Analytical Methods for Wipe Samples: EPA Method 8082 (PCBs).





Site Boundary

Building

Proposed Surface Scrape Sampling Location

Proposed Wipe Sampling Location

Proposed Soil Grab Sampling Location

Area of Interest

0 25 50 100

Scale in Feet

VAF-SHEL.DWG/T.PLT

EARTH TECH

Figure 4-21

Transformer Vault FACNO 7-TV18
Sampling locations

4.2.5 Master Substation 1 (FACNO 11-MS1)

Primary Concern: Areas of known leaks at MS-1 include P1, P4, P7, 40-13OCB, and 40-14OCB. All five areas require further investigation under the TSCA. In 1994, Aroclor 1260 was detected in one wipe sample at Transformer P7 at a concentration of 11,000 µg/100 cm^2 (Reference 179). The transformer was removed, but visible staining remains on edge of concrete pad and on a 2-foot x 2-foot area of gravel.

Investigative Activities: Wipe and surface scrape samples will be collected in areas of staining on the concrete pads and surrounding gravel. Samples will also be collected from beneath switch box oil drain ports. As per discussions with the OEPA (Reference 323), the hexagonal grid sampling approach described in "Verification of PCB Spill Cleanup by Sampling and Analysis" and "Field Manual for Grid Sampling of PCB Spill Sites To Verify Cleanup" will not be required for small release areas such as the ones at MS-1. The table below shows the maximum number of samples that are anticipated to be collected. Proposed sampling locations and methods are shown in Figure 4-22.

Rationale: . Results from the sample analyses will be compared to the EPA PCB Spill Cleanup Policy standards outlined in Section 2.1 to determine whether cleanup actions are necessary.

Maximum Number of Samples to be Collected at Master Substation 1

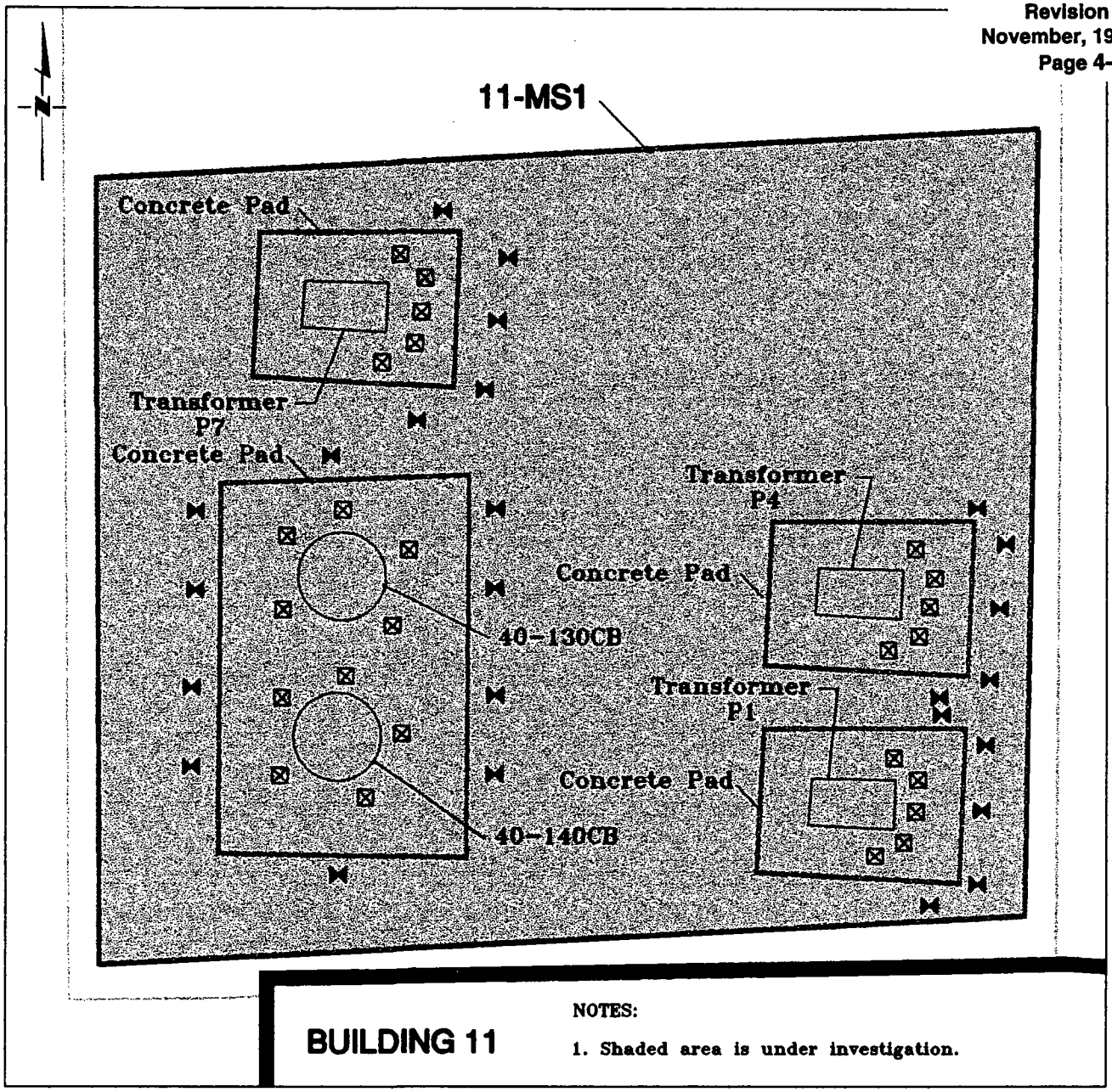
Sampling Point	Soil[1]	Other[2]
Wipe Samples	--	25
Surface Scrape Samples	25	--

(1) Analytical Methods for Soil Samples: EPA Method 8082 (PCBs).
(2) Analytical Methods for Wipe Samples: EPA Method 8082 (PCBs).

4.2.6 Substation 11A (FACNO 11-SUB11A)

Primary Concern: Substation 11A, located just north of master substation 1, contains transformers P1-1, P6, P8, and P74 (Reference 177). Transformer P74 is the transformer of concern. It had been noted as leaky prior to 1995. In 1995, approximately 1 cubic yard of soil and gravel was excavated from a stained area north and east of the substation. Concentrations of PCBs in closure samples from the excavation floor and sidewall were below detection limits for PCBs (0.033 mg/kg) (Reference 168). However, leaks were observed after this remedial effort at the gauge, panel, secondary bushing, and tap changer (Reference 172, 189). The transformer was removed in 1997 (Reference 314), but closure reports could not be identified during the records searches. It is unknown whether any PCB sampling and analysis were conducted at the time of removal. A steel housing unit remains at the site and covers clipped wires that lead directly underground.

Investigative Activities: Seven scrape samples will be collected using the hexagonal grid sampling approach recommended in "Verification of PCB Spill Cleanup by Sampling and Analysis." The center sample on the grid will be collected from inside the steel housing unit. The table below shows the maximum number of samples that are anticipated to be collected. Sampling locations and sampling type are shown in Figure 4-23.



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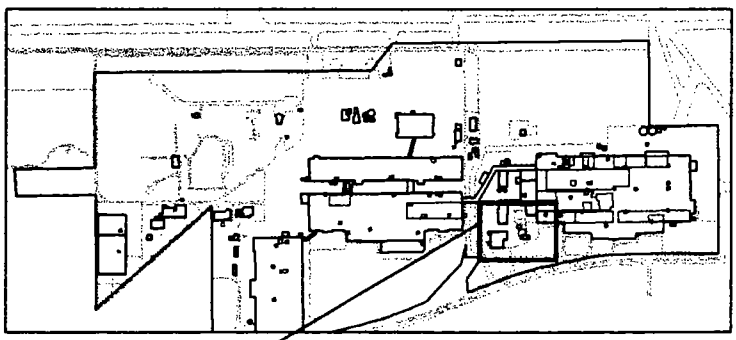

Site Boundary

Building

Proposed Surface Scrape Sampling Location

Proposed Wipe Sampling Location

Proposed Soil Grab Sampling Location

Area of Interest

0 5 10 20

Scale in Feet

VAP-SEL.DWG/Y.PLT

EARTH TECH

Figure 4-22

Transformer Vault FACNO 11-MS1
Sampling locations

11-SUB11A

11-MS1
(See Figure 4-22)

BUILDING 11

NOTES:

1. Shaded area is under investigation.

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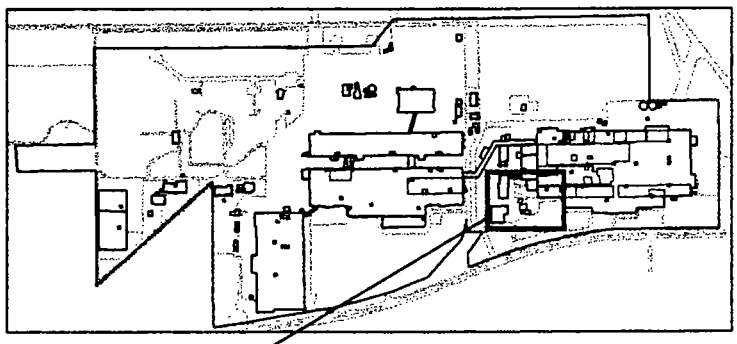


Area of Interest

Site Boundary

Building

Proposed Surface Scrape Sampling Location

Proposed Wipe Sampling Location

Proposed Soil Grab Sampling Location

0 15 30 60

Scale in Feet

VAP—BUILDING/T.PLT

EARTH TECH

Figure 4-23

Transformer Vault
FACNO 11-SUB11A
Sampling locations

Rationale: The hexagonal grid sampling technique to be employed at the site is recommended by EPA for verification of PCB spill cleanup that has already occurred, or prior to cleanup to establish the locations and extent of PCB contamination. For small transformer leaks of the type present at this site, the minimum recommended 7-point hexagonal grid is most appropriate. Results from the sample analyses will be compared to the EPA PCB Spill Cleanup Policy standards outlined in Section 2.1 to determine whether cleanup actions are necessary.

Maximum Number of Samples to be Collected at Substation 11A

Sampling Point	Soil[1]
Surface Scrape Samples	7

(1) Analytical Methods for Soil Samples: EPA Method 8082 (PCBs).

4.2.7 Master Substation 2 (FACNO 271-MS2)

Primary Concern: Master substation 2 contains transformers P50, PT-A, PT-B, PT-C, 40-14PT-A, 40-14PT-B, 40-14PT-C, 40-15PT-A, 40-15PT-B, 40-15PT-C and Sub-2-1 (Reference 213). Transformer Sub-2-1 is the transformer of concern. It was cleaned in 1995, but a PCB concentration of 1,700 µg/100 cm^2 was detected in a post-cleanup sample (Reference 168). Further investigation under the TSCA is required at this transformer.

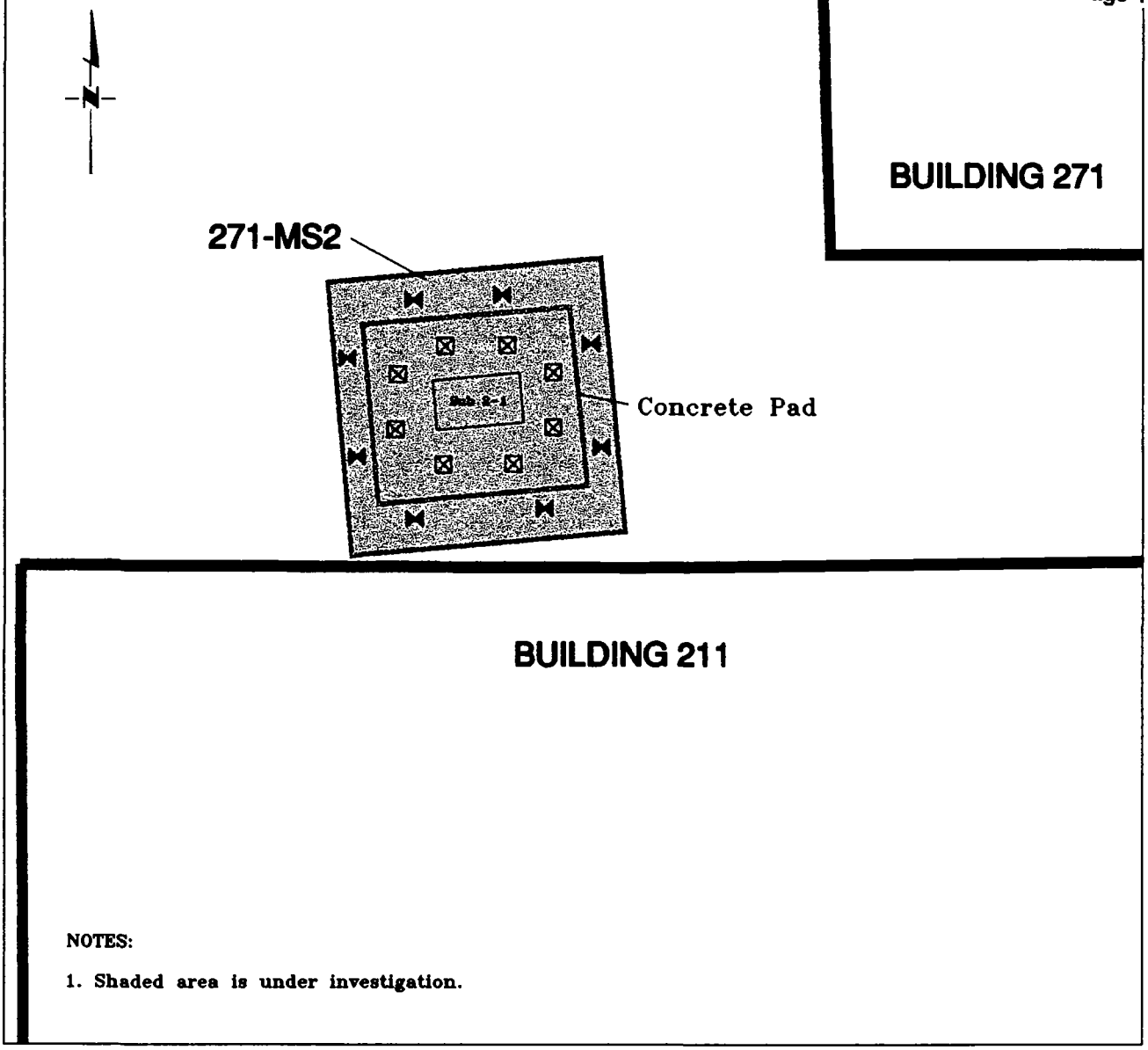
Investigative Activities: The hexagonal grid sampling approach will not be used at this site. Instead, two concrete wipe samples and two surface scrape samples will be collected on each side of the concrete pad, for a total of 8 wipe samples and 8 surface scrape samples. If visible stains are present at locations not included in the sampling scheme, then extra samples will be collected at these locations. The table below shows the maximum number of samples that are anticipated to be collected. Proposed sampling locations and methods are shown in Figure 4-24.

Rationale: Although the EPA recommends the hexagonal grid approach for PCB spill sampling, in this case it is not possible to locate a center point for sampling grids. Therefore, all sides of the concrete pad will be sampled to cover all areas of possible contamination around the pad. Results from the sample analyses will be compared to the EPA PCB Spill Cleanup Policy standards outlined in Section 2.1 to determine whether cleanup actions are necessary.

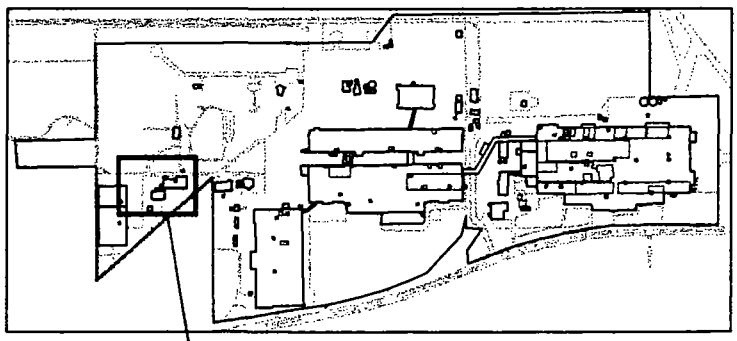
Maximum Number of Samples to be Collected at Master Substation 2

Sampling Point	Soil[1]	Other[2]
Wipe Samples	--	8
Surface Scrape Samples	8	--

(1) Analytical Methods for Soil Samples: EPA Method 8082 (PCBs).
(2) Analytical Methods for Wipe Samples: EPA Method 8082 (PCBs).



05/98



Site Boundary

Building

Proposed Surface Scrape Sampling Location

Proposed Wipe Sampling Location

Proposed Soil Grab Sampling Location

Area of Interest

VAP—DGELDWG/T.PLT

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Figure 4-24

Transformer Vault FACNO 271-MS2
Sampling locations

5.0 Sampling and Analysis Protocols

Sampling and analysis protocols and their objectives concerning the investigation of the UST sites will comply with OAC 1301:7-9-13, the Petroleum UST Corrective Action Rule of the Ohio Underground Storage Tank Regulations (Reference 315). However, as suggested by BUSTR (Reference 322), soil boring locations will be based on soil sampling locations prescribed by OAC 1301:7-9-12 for the closure assessment of a UST system. Sampling and analysis protocols and their objectives concerning the investigation of the PCB sites will comply with 40 CFR 761 Subpart G, the USEPA's PCB Spill Cleanup Policy.

The following sections discuss the data quality program; site preparation and restoration; soil sampling; groundwater sampling; wipe sampling; sample identification, custody, and handling; field quality control samples; field program systems audits; corrective actions; and disposal of investigation-derived wastes.

The sampling methodologies and their function are summarized below:

- **Soil Sampling**. Soil sampling is required during a UST site check to detect contaminants before groundwater has been affected. Soil sampling will be conducted during the investigation to characterize the horizontal and vertical extent of any contamination in soil adjacent to the former USTs (including associated piping), determine the concentration of any soil contamination, and define site geology. Analytical parameters and methods are summarized in Table 5-1.

  Soil sampling is also required during investigations of PCB-contaminated sites. Soil sampling will be conducted to verify whether PCB spills have occurred at identified sites; determine the concentrations of PCBs at these sites; and determine, to the extent possible, the size of the contaminated area. Soil sampling activities at each site will include the collection of surface scrape samples or subsurface grab samples. Analytical parameters and methods are summarized in Table 5-1.

- **Groundwater Sampling**. If groundwater is encountered during site check drilling activities, a groundwater sample must be collected, if possible, to detect contamination before a drinking water source has been seriously impacted. If it is not possible to collect a groundwater sample from the borehole, a soil sample will be collected from immediately above the soil/groundwater interface. Analytical parameters and methods are summarized in Table 5-1.

- **Wipe Sampling**. Wipe samples will be collected at locations where PCBs are suspected to have been released to concrete surfaces.

- **Laboratory Analyses**. An OEPA-certified laboratory will provide the analytical services outlined in Table 5-1 to identify the types and concentrations of contaminants in the soil and groundwater samples. This will help ensure that all

Table 5-1
Recommended Sample Storage, Preservation, and Holding Times According to Measurement

Parameters	Matrix[1]	Method	Minimum Volume Required [2]	Container[3]	Preservative	Holding Time[4]
Diesel and Gasoline Range	W	SW8015 (modified)	1,000 ml (DRO) 40 ml (GRO)	G (amber), Teflon cap G, Teflon septum lid	HCl to pH<2, Cool to 4°C	14 days
	S	SW8015 (modified)	4 oz.	G, Teflon cap	Cool to 4°C	14 days
Polychlorinated Biphenyls (PCBs)	W, S	SW8082	1 liter or 8 oz.	G, Teflon cap	4°C, pH 5-9	Water – 7 days until extraction; 40 days after extraction Soil – 14 days until extraction; 40 days after extraction
Semivolatile Organic Compounds	W, S	SW8270	1 liter or 8 oz.	G, Teflon cap	4°C, 0.008% $Na_2S_2O_3$	Water – 7 days until extraction; 40 days after extraction Soil – 14 days until extraction; 40 days after extraction
Volatile Organic Compounds	W	SW8240/ SW8260	2 x 40 ml	G, Teflon septum lid	Teflon-faced, glass VOA vials. Cool to 4°C, eliminate free air space. Add 4 drops concen-trated HCl per 40 ml vial	14 days
Volatile Organic Compounds	S	SW8240/SW8260	4 oz.	G, Teflon septum lid	Cool to 4°C	14 days
Volatile Organic Compounds	S	SW8020	4 oz.	G, Teflon septum lid	Cool to 4°C	14 days
Volatile Organic Compounds	W	602	2 x 40 ml	G, Teflon septum lid	4°C, pH 2, HCl	14 days
Volatile Organic Compounds	W	624	2 x 40 ml	G, Teflon septum lid	4°C, pH 2	14 days
Polyaromatic Hydrocarbons	S	SW8100	4 oz.	G, Teflon cap	Cool to 4°C	Soil – 14 days until extraction; 40 days after extraction
Polyaromatic Hydrocarbons	W	610	1,000 ml	G (amber), Teflon cap	Cool to 4°C	Water – 7 days until extraction; 40 days after extraction
TPH	S	418.1	4 oz.	G (amber), Teflon cap	4°C, pH 2, HCl	28 days

Note: Table 5-1 includes absolute minimum volumes for the implementation of each appropriate chemical analysis. Typical sample volumes collected are far in excess of minimum volumes for QC purposes and are documented within approved site-specific sampling plans.

Key:
(1) W = Water matrix, S = Solid matrix.
(2) DRO = Diesel range organics, GRO = Gasoline range organics
(3) Glass (G)
(4) The listed holding times initiate from time of sampling and are recommended for properly preserved samples based on currently available data. It is recognized that extension of these times may be possible for some sample types while, for other types, the times may be too long. When shipping regulations prevent the use of the proper preservation technique or when the holding time is exceeded, as in the case of a 24-hour composite, the final reported data for these samples should indicate the specific variance. If samples cannot be analyzed within the specified time intervals, the final reported data should indicate the actual holding time.

References include:
Standard Methods for the Examination of Water and Wastewater, 18th Edition (1992).
Methods for Chemical Analysis of Water and Wastes, USEPA Manual, 600/4-79-020 (USEPA, 1983 - with additions).
Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, 40 CFR 136, Appendix A.
Inductively Coupled Plasma - Atomic Emission Spectrometer Method for Trace Element Analysis of Water and Wastes, 40 CFR 136, Appendix C.
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition (USEPA 1986).
Required Containers, Preservation Techniques, and Holding Times, 40 CFR 136.3, Table II.
American Society for Testing and Materials, (1988).

analytical data generated during this effort will meet the VAP data quality standards such that analytical results could be used, as necessary, once a site becomes eligible for the VAP.

5.1 Quality Program

All analyses required at AFP 85 will be completed in a manner that ensures the data are scientifically accurate and comparable in quality and type with the data from previous studies. To help achieve these objectives, standards for data quality will be established to ensure a consistently high degree of analysis reliability. These data quality characteristics, discussed below, consist of accuracy, precision, completeness, representativeness, and comparability. All soil, groundwater, and wipe sampling and analysis will be consistent with USEPA procedures, as contained in the USEPA document "Test Methods for Evaluating Solid Wastes-Physical/Chemical Methods" (SW-846; November, 1986).

Accuracy. Accuracy is defined as the degree of agreement of a measurement, X, with an accepted true value, T. The laboratory will use four types of check samples for accuracy assessment: the laboratory control sample (or blank spike), the matrix spike (MS), continuing calibration standards, and method blanks. (A measure of "not detected" in a sample known to be free of the analyte (method blank) is a measure of accuracy.)

The formula used to calculate accuracy is:

$$\text{Percent Recovery} = \frac{\text{Concentration measured}}{\text{Concentration spiked}} \times 100\%$$

For MSs, the formula must correct for background concentration found in the unspiked fraction:

$$\text{Percent Recovery} = \frac{(\text{Concentration in Spiked Aliquot} - \text{Concentration in Unspiked Aliquot})}{\text{Concentration of Spiked Added}} \times 100\%$$

Precision. Precision is a measure of the mutual agreement among individual measurements of the same property, usually under prescribed similar conditions. Analytical precision is assessed through comparison of duplicate samples or matrix spike duplicate samples (MSD). The term is expressed as relative percent difference (RPD):

$$\text{RPD} = \frac{\text{MS} - \text{MSD}}{0.5\,(\text{MS} + \text{MSD})} \times 100\% \text{ for matrix spike samples}$$

$$\text{RPD} = \frac{\text{Rep 1} - \text{Rep 2}}{0.5\,(\text{Rep 1} + \text{Rep 2})} \times 100\% \text{ for duplicate samples}$$

Completeness. Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected under correct normal conditions. To maximize completeness of laboratory analysis, it is essential to have a

sufficient quantity of each sample to provide for original and repeat analyses should the original analysis fail to meet acceptance criteria.

Completeness for each analyte, per method, per matrix is calculated as:

$$\frac{\text{Number of successful analyses}}{\text{Number of requested analyses}} \times 100\%$$

Successful analyses are those that were performed when the instruments and methods were in control. Valid data are those that are useful based on qualifying criteria. These criteria are presented in the protocols specified in the SW846 tuning criteria modifications.

The target value for completeness is 100 percent. A completeness value of 90 percent will be considered acceptable. Incomplete results will be reported to the Earth Tech Project Manager by the Project Quality Assurance Officer.

Representativeness. Objectives for representativeness are defined for the sampling and analysis task and are a function of the investigative objectives. Representativeness shall be achieved through use of the standard field, sampling, and analytical procedures. Representativeness is also determined by appropriate project design, with consideration of elements such as proper drilling procedures and sampling locations. Decisions regarding boring/sample locations and numbers are documented in Section 4.

Comparability. Comparability is the confidence with which one data set can be compared to another data set. The objective for this quality program is to produce data with the greatest possible degree of comparability. The number of matrices that are sampled and the range of field conditions encountered are considered in determining comparability. Comparability is achieved by using standard methods for sampling and analysis, reporting data in standard units, normalizing results to standard conditions, and using standard and comprehensive reporting formats. Complete field documentation using standardized data collection forms shall support the assessment of comparability.

5.2 Site Reconnaissance, Preparation, and Restoration Activities

Sampling locations will be identified as part of the initial site reconnaissance. Where practical, staking will be done by driving a flag or wooden stake into the ground. In paved/concrete-covered areas, spray paint will be used to identify direct push sampling locations.

Areas designated for intrusive sampling will be surveyed for the presence of underground utilities. Utility locations will be determined using existing utility maps and surface geophysical surveys. Surface geophysical techniques will include those techniques most appropriate for the site conditions, and may include ground penetrating radar, magnetometry, and electromagnetic techniques.

Each work site or sampling location shall be returned to its original condition when possible. Portions of the study area are grass-covered; the investigation is not expected

to significantly alter the existing site conditions at these areas. Portions of the study area are covered with asphalt or concrete; holes created during direct push sampling at these locations will be backfilled with grout then capped with a like material.

Efforts will be made to minimize impacts to work sites and sampling locations. Following the completion of work at a site, all trash and other waste will be removed.

5.3 Soil Sampling

UST Sites. All soil samples will be collected from soil borings installed using direct push methods. The use of direct push methods will allow for the collection of undisturbed, discrete samples. An Earth Tech subcontractor will perform the direct push sampling and provide all necessary equipment. All regulations and requirements pertinent to safety will be observed. An Earth Tech geologist will supervise the collection of samples at each location. All sampling activities will be recorded in field logbooks.

As suggested by BUSTR (Reference 322), soil boring locations will be based on soil sampling locations prescribed by OAC 1301:7-9-12. At UST sites where inadequate historical information (concerning the location of the UST(s)) exists to provide accurate placement of soil borings, soil borings will be located on a grid pattern to characterize the general area rather than specific locations defined in OAC 1301:7-9-12. The grid pattern will cover an area as large as necessary to ensure characterization of potential contamination related to the UST site. Maps showing the proposed soil boring locations at each UST site are provided in Section 4.

Soil samples will be collected with a Geoprobe™ or equivalent device by hydraulically driving a 2-inch-diameter, 4-foot-long, stainless steel sampler vertically into the ground. Each sampler will contain a new, nonreactive (polycarbonate or acetate) liner. Each boring will be continuously sampled from 2 feet below the ground surface until boring termination. A boring will be terminated when one of the following occurs: a depth of 20 feet is reached, direct push refusal occurs, or the groundwater table or a groundwater confining layer is encountered.

After driving the sampler through a 4-foot soil interval, the sampler will be removed from the hole and the soil core will be removed from the sampler. The polycarbonate/acetate liner will then be cut open and the soil sample will be removed from the portion of the soil core that corresponds to the desired sampling depth. The remaining soil will be used for soil classification and the preparation of boring logs.

Soil samples will be collected from the liners at 2-foot intervals (unless field observations, such as PID readings, staining and odors, indicate that a smaller sampling interval is required) and screened in the field to determine which sample will be sent to the laboratory for analysis. Each sample will be split into two equally representative halves and the following activities will be performed:

- One half of the sample will be tightly sealed in a laboratory-provided glass sample container with a teflon™-lined lid, labeled, and placed on ice for

transportation to the laboratory. This container will be used for laboratory analysis and will not be opened.

- The other half of the sample will be placed into another container, allowing some space for the accumulation of vapor. This container will be sealed (to prevent the loss of VOCs), and allowed to stand for 10 to 15 minutes at approximately 70°F. This container will be used for field screening (i.e., headspace analysis).
- Each screening sample will be screened in the field with a PID. Field screening will also include observations of staining or other discolorations, odors, or any other physical characteristics which may indicate impact to the soil sample. The preserved samples (for laboratory analysis) corresponding to the highest screened samples will be sent to the laboratory for analysis. If field screenings do not register a PID reading, then the soil sample collected from the bottom of the boring or from immediately above the groundwater table will be sent to the laboratory for analysis. A minimum of one sample from each boring will be sent for analysis.

Descriptions of site soils collected during the direct push soil sampling will be recorded on a standard boring log (see Figure 5-1). The following information will be entered in the log:

- Project name and number;
- Boring location;
- Name of geologist;
- Description of direct push equipment and direct push operator's name and company;
- Special problems encountered and their resolution;
- Distinct boundaries between soil types and depths of occurrences;
- Depth of groundwater (if applicable);
- Estimated depth interval of each sample taken or classified, length of sample interval and sample recovery, and sampler type and size;
- Description of each soil sample taken according to the methodology in ASTM D2488-93. Soil sample descriptions will include the following
  - soil type
  - grain shape
  - grading of the predominant fraction (poor, moderate, or well)
  - color
  - plasticity of fines (nonplastic, low, medium, high)
  - odor, if organic or unusual
  - other: presence of roots or rootholes, mica, gypsum, or surface coatings on coarse-grained particles
- Sample depths and sample numbers.

For soil sampling locations covered by concrete, concrete coring will be performed to permit access for direct push soil sampling as described above.

Borehole Log

Project Name: --		**Project Number:** --	
Borehole Location: --		**Borehole No.:** --	**Sheet 1 of 1**
Drilling Agency: --		**Driller:** --	
Drilling Equipment: --		**Date Started:** --	**Total Depth (feet):** --
Drilling Method: --		**Date Finished:** --	**Depth to Bedrock (feet):** --
Drilling Fluid: --		**Number of Samples:** --	**Depth to Water (feet):**
Completion Information:		**Borehole Diameter (in):** --	**Elevation and Datum:**
		Logged By: --	**Date:** --
		Checked By: --	**Date:** --

Depth (feet)	Sample: Number	Sample: Interval	Sample: Blow Count	Sample: Recovery	Sample: Time	Field Analysis: FID (ppm) S/B*	Field Analysis: PID (ppm) S/B*	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Remarks
5											
10											
15											
20											
25											
30											

Key

* S/B = Sample reading / background reading
N/A = Not analyzed

Form F-1009
9/1/91

Figure 5-1

Sample Borehole Log

All downhole equipment, including drive points, direct push rods, and soil samplers, will be decontaminated between each direct push sampling location using the following method: the equipment will be washed in potable water and alconox™, rinsed with potable water, rinsed with distilled water, and allowed to dry completely. Following proper decontamination procedures will allow for the collection of representative samples.

Ambient air will be monitored during all direct push activities with a PID to identify any potentially hazardous toxic vapors. Readings will be taken at the worker's breathing zone height and adjacent to the direct push rig. Air monitoring results will be included in the boring logs.

PCB Sites. Each PCB site will require the collection of either surface soil scrape samples or subsurface soil grab samples. An Earth Tech geologist or other qualified personnel will collect the soil samples at each location. All regulations and requirements pertinent to safety will be observed. All sampling activities will be recorded in field notebooks.

Surface soil scrape sampling will be required at locations where surface soils are suspected to have been contaminated with PCBs. As suggested by OEPA (Reference 323), the scrape sampling approach will generally follow that described in "Verification of PCB Spill Cleanup by Sampling and Analysis" and "Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup." Samples will be collected by scraping stained surface soil from each location with a stainless steel shovel and placing the soil in a laboratory-provided glass sample container with a teflon™-lined lid. Each sample will be labeled and placed on ice for transportation to the laboratory.

Subsurface soil grab samples will be required at locations where drains from PCB sites discharge directly to subsurface soils. Grab samples will be collected using a hand auger by manually turning an auger equipped with a 3-inch-diameter cylindrical stainless steel bit. Each hand auger boring will be advanced to the discharge point of the drain pipe from the PCB site, and a grab sample will be collected in a laboratory-provided glass sample container with a teflon™-lined lid. Each sample will be labeled and placed on ice for transportation to the laboratory.

All sampling equipment will be decontaminated between each sampling location following the method described in the UST soil sampling section above.

5.4 Groundwater Sampling

Groundwater samples will be collected from each soil boring location where groundwater is encountered during direct push soil sampling activities. If groundwater is encountered, soil sampling will cease and a groundwater sample will be collected from the boring. If it is not possible to collect a groundwater sample from the boring, then a soil sample will be collected from immediately above the soil/groundwater interface. An Earth Tech geologist will supervise the collection of samples at each location. Maps showing the locations of the soil borings at each UST site are provided in Section 4. All sampling activities will be recorded in field logbooks.

If groundwater is encountered during soil sampling, soil sampling will cease and the soil sampling equipment will be removed from the boring. A groundwater sampling probe will then be driven back down the same hole to a depth immediately below the groundwater table. When the probe is at the proper depth, sampling ports on the probe will be opened, and the sample will be collected by oscillating a dedicated polyethylene sampling tube equipped with a decontaminated ball check valve up and down through the water column in the bottom of the sampling probe. This will allow groundwater to slowly rise up through the polyethylene tubing to the land surface, where groundwater samples will be collected after purging a tubing volume. The resulting groundwater samples will not be subjected to severe agitation or sudden pressure changes as typically occurs with samples collected with a pump. Therefore, the groundwater samples will be representative of conditions in the water-bearing zone.

If it is not possible to collect a groundwater sample from a boring, then the soil sample that was collected (and placed in a laboratory container awaiting the results of sample screening, as discussed in Section 5.3) from immediately above the soil/groundwater interface will be sent to the laboratory for analysis.

All downhole equipment, including sampling probes, direct push rods, and check valves, will be decontaminated between each direct push sampling location using the following method: the equipment will be washed in potable water and alconox™, rinsed with potable water, rinsed with distilled water, and allowed to dry completely. Following proper decontamination procedures will allow for the collection of representative samples.

5.5 Wipe Sampling

Wipe samples will be collected on hexane-soaked gauze pads wiped within a 10-cm x 10-cm (100 cm^2) paper template. The templates will be placed at selected sample locations along with a pre-labeled, 4-ounce jar that will contain a hexane-soaked gauze pad. A new pair of nitrile gloves will be donned during the collection of each PCB wipe sample. The gauze will be removed from the jar and then wiped horizontally, vertically, and finally in an "S" pattern over the 100 cm^2 area. The gauze will be allowed to dry before placing it back in the jar and sealing it. The sampling glove and template will then be discarded prior to proceeding to another wipe sample location. The location of the wipe sample will be measured from two points in case accurate relocation of the sampling area is required.

5.6 Sample Identification, Custody, and Handling

Throughout the field program, consistent and thorough sample identification and chain-of-custody procedures will be followed by both field and laboratory personnel. This section documents the requirements, forms, and contingencies for each of these procedures.

5.6.1 Field Logs and Sample Identification

Daily Logs. Information pertinent to the sampling program will be recorded in ink in a waterproof, bound logbook with consecutively numbered pages. Logbook entries will be made in water-resistant ink and will include the following, as applicable:

- Names and affiliations of personnel on site;
- General description of each day's field activities;
- Documentation of weather conditions during sampling (temperature, cloudiness, precipitation);
- Location of sampling (site number as description);
- Sample depth;
- Name and address of field contact (in cover of logbook);
- Type of sample matrix (i.e., soil or groundwater);
- Date and time of collection;
- Sample identification number(s);
- Field screening results;
- Sample distribution (e.g., laboratory, shipper, etc.);
- Observations of sample or collection environment, if needed;
- Preservatives used and intended analyses;
- Sampler's name; and
- Sample type (e.g., grab, composite, split, etc.).

Logbook pages completed largely or entirely by a single person may simply be signed and dated at the bottom of the page. Occasional entries by other personnel must be individually initialed.

Corrections to the logbook will be made by drawing a single line through the incorrect entry in such a way that the incorrect entry may still be read, and entering the correct information. Any error discovered subsequently should be corrected, initialed, and dated by the person who made the entry.

Photographs. Photographs will be recorded in the appropriate logbook section or in additional sections as needed. Information to be recorded includes:

- Roll and frame number;
- Date;
- Time;
- Photographer;
- Location and direction of photograph (e.g., "east side of Building 10, looking north");
- Subject (e.g., "boring XX");
- Significant features; and
- Names of any personnel included in the photograph.

Sample Identification. Sampling locations (including direct push soil and groundwater, wipe, scrape, and soil grab sampling locations) will be assigned numbers in sequential order as described below. Sample numbers will be assigned on the basis of a code system that provides blind samples to the laboratory, with no duplication of numbers. The sample identification code incorporates information such as the UST or PCB site number, the sampling location number, the sample medium, the sample type (e.g., environmental sample, duplicate sample, etc.), and the sample date.

An example identification code for sampling activities at UST sites is as follows:

110-087-SO1-092498

where:	110	=	UST Number;
	087	=	Direct Push Sampling Location Number 87;
	SO	=	Direct Push Soil Sample (GW = direct push groundwater sample, TB = trip blank, FB = field blank, EB = equipment blank);
	1	=	Environmental Sample (9 = duplicate/replicate sample); and
	092498	=	Sample Date (September 24, 1998).

An example identification code for sampling activities at PCB sites is as follows:

SUB27-001-SC1-092598

where:	SUB27	=	PCB Site Number;
	001	=	Soil Scrape Sampling Location Number 1;
	SC	=	Scrape Sample (WP = wipe sample, SG = soil grab sample, FB = field blank, EB = equipment blank);
	1	=	Environmental Sample (9 = replicate sample); and
	092598	=	Sample Date (September 25, 1998).

5.6.2 Sample Custody

To maintain and document sample custody, the following chain-of-custody procedures will be strictly followed. A sample is considered to be under custody if:

- It is in actual possession of the responsible person;
- It is in view, following physical possession;
- It is in possession of a responsible person and is locked or sealed to prevent tampering; and
- It is in a secure area, such as a locked room or locked vehicle.

Sample Tags. Samples are identified by a sample tag, illustrated in Figure 5-2. The information recorded on the sample tag includes:

- Project Number;
- Sample Number;

Earth Tech, Inc **Project No. _____**

AFP 85

Sample No. _____

Depth _____ (ft)

Date _____ Time _____ Samplers _____

Analyses _____

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Sample Tag Form

- Depth (if applicable, the distance below the land surface from which the sample was taken);
- Date (in MM/DD/YY format) and time;
- Sampler(s); and
- Analytical method(s) requested.

After completion, the tag is attached to the sample container with clear sealing tape. In some cases, adhesive sample labels may be used rather than sample tags. In this case, the tag information is written on the label, which is affixed to the body of the sample container (not the lid) and covered with clear sealing tape.

Chain-of-Custody Record. Sample custody is maintained by a "Chain-of-Custody Record". The custody record is completed in duplicate by a member of the sampling crew designated by the Project Manager. The information recorded on this record includes:

- Project Number;
- Project Name;
- Sampler's Signature;
- Sample Number;
- Type of Sample Container (e.g., 40 ml glass VOA);
- Location (UST site number);
- Sample Material (i.e., soil or groundwater);
- Preservation Method (preservation temperature and/or preservation chemical);
- Analysis Required (e.g., TPH by Method 418.1);
- Relinquished by (the name and signature of the person giving up the sample);
- Date/Time Relinquished (the date and time at which the sample was given up);
- Received by (the receiver's name will be printed and signed);
- Organization (the name of the receiving organization);
- Date/Time Received (the date and time at which the sample was received); and
- Special Shipment/Handling/Storage Requirements (any appropriate remarks).

Transfer of Custody. The field personnel initially collecting the sample are responsible for its care and custody until it is properly transferred or delivered to laboratory personnel. All samples will be accompanied by a chain-of-custody record.

When transferring the possession of samples, the individuals relinquishing and receiving will sign, date and note the time on the chain-of-custody record. The company from which the sample is relinquished, the company to which it is delivered, and the reason for transfer are noted. The chain-of-custody record documents the transfer of samples from the custody of the sampler to that of another person, or to the laboratory. In addition, the relinquishing individual will record specific shipping data (airway bill number, office, time, and date) on the original and duplicate custody records. It is the Project Manager's responsibility to ensure that all records are consistent and that they are made part of the permanent project file.

The original copy of the form will accompany the shipment, and a copy will be retained by the Project Manager or a designee. After the form is signed and a duplicate removed for the field file, the form is enclosed in a plastic bag taped to the inside lid of the shipping container, which is then sealed for shipment.

If sent by mail, the package is registered with return receipt requested. If sent by common carrier, a bill of lading is used. Freight bills, postal service receipts, and bills of lading are retained as part of the permanent documentation.

5.6.3 Procedures for Sample Handling and Packaging

After samples have been collected, tagged, and logged in the logbook, they will be packaged and shipped in accordance with the following protocols:

- Sample bottle lids will never be mixed. All sample lids must stay with the original containers.
- For liquid samples, the sample volume level will be marked with a grease pencil or by placing the top of the label at the appropriate sample height. This procedure will help the laboratory determine if any leaks occurred during shipment. The label should not cover any bottle preparation QA/QC marks.
- All sample containers and shipping containers will be secured with a custody seal. Custody seals are preprinted adhesive-backed seals which are placed over the lid of the sample or shipping container bottle, and are designed to break if the bottle cap is disturbed. The seal is signed and dated by the person in custody of the sample.
- All shipping containers will be locked or custody-sealed for shipment to the laboratory.
- Unless otherwise specified, sealed sample bottles will be placed in a sealable plastic bag prior to placement in the shipping container to prevent contamination by the shipping material.

Packaging of Field Samples for Shipment. After samples are labeled, enclosed within individual plastic bags, and documented on the chain-of-custody forms, they will be placed in a metal or plastic shipping cooler which has been lined with approximately three inches of vermiculite or other inert packing material. Sample bottles may be enclosed within a plastic garbage bag in the cooler for added protection. Samples will be wrapped in plastic bubble-wrap or placed in the vermiculite in such a way that sample bottles are prevented from banging into one another. Once in the cooler, the samples will be surrounded by vermiculite or bubble wrap, and, if required, cooled by the use of frozen "Blue Ice" or bagged natural ice. In no case will ice be used as a substitute for packing material.

5.7 Field Quality Control Samples

Field blanks and duplicate/replicate samples will be collected to ensure that analytical data of known quality are generated. The type of field blanks and duplicate/replicate samples and the frequency of use of these samples are discussed below.

Trip Blanks. Trip blanks are samples of organic-free water that are prepared at the same location and time as the sample bottles. They remain with the sample bottles while in transit to the site, during sampling, and during the return trip to the laboratory. Upon return to the laboratory, they will be analyzed as if they were another environmental sample. If these samples are accidentally opened, it must be noted on the chain-of-custody record. One trip blank will accompany each cooler sent to the laboratory; these samples will be analyzed for VOC analytes.

Field Blanks. Field blanks are prepared by filling containers with deionized water at the site and preserving with the appropriate reagents. Upon return to the laboratory, they will be analyzed as if they were another environmental sample. If these samples are accidentally opened, it must be noted on the chain-of-custody record. One field blank will be collected each day samples are collected; these samples will be analyzed for VOC analytes.

Equipment Blanks. Equipment blanks are prepared by pouring deionized water over or through the decontaminated sample collection device and collecting this water in a sample container. Upon return to the laboratory, they will be analyzed as if they were another environmental sample. If these samples are accidentally opened, it must be noted on the chain-of-custody record. One equipment blank will be collected for every 20 environmental samples collected of a specific media type (e.g., 1 per 20 soil samples); these samples will be analyzed for all laboratory analyses requested for the environmental samples at the UST site.

Duplicate Samples. A field duplicate sample is a second groundwater sample collected at the same location as the original groundwater sample. Duplicate samples are collected simultaneously or in immediate succession, using identical recovery techniques, and treated in an identical manner during storage, transportation, and analysis. The sample containers are assigned an identification number in the field such that they cannot be identified (blind duplicate) as duplicate samples by laboratory personnel performing the analysis. One duplicate groundwater sample will be collected for every 10 groundwater samples.

Replicate Samples. A field replicate sample, also called a split, is a single soil sample divided into two equal parts for analysis. The sample containers are assigned an identification number in the field such that they cannot be identified as replicate samples by laboratory personnel performing the analysis. One replicate soil sample will be collected for every 10 soil samples.

5.8 Field Program Systems Audits

The systems audits will be performed by the Project Manager or their designated representative to evaluate whether all the planned or implemented procedures of the field program are consistent with the protocols in the Work Plan. To accomplish this, the systems audits will consist of the following activities:

- Observation of drilling and sampling activities to ensure that field protocols are being followed;
- Observation of instrument calibration to verify that the proper calibration procedures and schedules are being followed;
- Observation of the health and safety practices of field personnel to ensure that they are consistent with the Site Health and Safety Plan;
- A review of field chain-of-custody procedures to verify that sample possession, transfer, and documentation procedures are satisfactory; and
- Inspection of sampling and field testing equipment to verify that the equipment is in operable condition and used properly.

Any inconsistency in the observed procedures will be immediately addressed by the Project Manager, who will immediately take steps to rectify the problem and prevent its recurrence. If necessary, the effects of the inconsistency on sample quality will be examined and noted in the field logbook.

5.9 Corrective Action

The Project Manager will be responsible for initiating corrective actions in response to QA problems in the field program. The essential steps in the corrective action system are:

- Identification and definition of the problem,
- Assignment of responsibility for investigating the problem,
- Investigation and determination of the cause of the problem,
- Determination of a corrective action to eliminate the problem,
- Implementation of the corrective action and evaluation of its effectiveness, and
- Verification that the corrective action has eliminated the problem.

Laboratory corrective action procedures will be similar but will be the responsibility of the contract laboratory manager assigned to the project. Any corrective actions performed by the laboratory will be documented in writing and submitted to the project manager for inclusion in the permanent project files.

5.10 Disposal of Investigation-Derived Waste

One of the advantages of using direct push technology is that minimal investigation-derived waste (i.e., soil cuttings and groundwater) is generated during sample collection. The only soils that will be generated during the investigation are those portions of the

soil cores that will not be used for laboratory analysis. The excess soils will be collected in Department of Transportation (DOT)-approved steel 55-gallon drums. Each drum will be properly labeled with the UST site identification, direct push sampling location, matrix, depth, potential contaminants, and date. The soils will be segregated into different drums on the basis of the anticipated contaminants (based on the historical information presented in Section 3). For example, soils potentially contaminated with petroleum substances will be segregated from soils potentially contaminated with hazardous substances. These drums will be stored at a staging area until they are properly characterized and disposed of in accordance with federal, state and local regulations.

Minimal amounts of groundwater will be generated while purging one volume from the polyethylene sampling tube prior to the collection of each groundwater sample. This groundwater will be contained in DOT-approved steel 55-gallon drums. Each drum will be properly labeled with the UST site identification, direct push sampling location, matrix, potential contaminants, and date. The groundwater will be segregated into different drums on the basis of the anticipated contaminants (based on the historical information presented in Section 3), similar to the procedure described for soil.

6.0 Project Schedule

The proposed schedule for completing the investigation of the VAP-ineligible sites at AFP 85 is presented in Figure 6-1. The project schedule includes the field activities, laboratory analysis, and report preparation.

Project:26923-04
Date:Wed 11/11/98

FIGURE 6-1
Ineligible VAP Sites Investigation Schedule
AFP 85

ID	Task Name	Duration
1	Notice To Proceed	1 day
2	Procurement	30 days
3	**Field Activities**	**73.2 days**
4	Mobilization	3 days
5	Geophysical Clearance	11 days
6	Concrete Coring	4 days
7	Direct Push Sampling	15 days
8	Wipe Sampling	3 days
9	Soil Sampling	3 days
10	Waste Transportation & Disposal	45 days
11	Surveying	4 days
12	Demobilization	3 days
13	Lab Analyses/Data Validation	60 days
14	Data Management	60 days
15	**Ineligible VAP Sites Report**	**180 days**
16	Develop Internal Draft Report	65 days
17	Internal Draft Review by ASC	30 days
18	Develop Draft Report	14 days
19	Draft Review by ASC/OEPA/BUSTR	30 days
20	Develop Draft Final Report	14 days
21	Draft Review by ASC/OEPA/BUSTR	20 days
22	Develop Final Report	7 days

Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary
Split
Rolled Up Split

Appendix A

References for Air Force Plant 85

Appendix A-1

Sorted by Reference Number

Reference Number	Title	Date	Sort Code
3	Aerial Photographs received from ODOT and ODNR.	1938, 1949, 1955, 1960, 1963, 1964, 1972, 1979, 1986, 1989, 1994	GEN
4	Air Pollution Study of the Naval Air Industrial Reserve Plant, Columbus, Ohio, Cottrell Environmental Systems.	December 1, 1970	A
5	Air Quality Analysis of a Revised SO2 Emission Limitation in the Ohio State SIP for Rockwell International, HMM Associates.	December 1982	A
6	AFP 85 PCB Annual Report for 1981, Control of PCBs, TSCA - Part 761.	January 1, 1981 through December 31, 1981	PCB
7	AFP 85 PCB Annual Report for 1992, Control of PCBs, TSCA - Part 761.	January 1, 1992 through December 31, 1992	PCB
8	Application for a permit to operate an air containment source, Ohio Environmental Protection Agency.	March 10, 1983	A
9	Appraisal of Transonic/Supersonic Wind Tunnel, AFP 85, International Research & Appraisal Company.	January 30, 1990	GEN
10	Appraisal of Wind Tunnel Disposal Area including a Subsonic and a Transonic/Supersonic Wind Tunnel, Columbus, Ohio, International Research & Appraisal Co.	April 26, 1991	GEN
11	Appraisal of 38.38 acre tract of land, AFP 85, International Research & Appraisal Co.	March 21, 1991	RP
12*	Asbestos Survey Report, McDonnell Douglas Facility, Prepared for Mosur & Syrakis Co., by Universal Asbestos Management.	August 1989	AS
13	Besgrove, Dorris, Letter to Uylaine E. McMahan, Chief, Ohio Environmental Agency, Regarding Notice of Violation, McDonnell Douglas Corporation, OH171700890004.	February 28, 1992	NOV
14	Bowers, Christopher L., Letter to Uylaine E. McMahan, Chief, Ohio Environmental Agency, Regarding Notice of Violation, McDonnell Douglas Corporation, OH17170090004.	December 10, 1992	NOV
16	Carlisle, Tom. Letter to George Hamper, Chief of USEPA, Region V, regarding Statement of Basis.	June 2, 1986	GEN
17*	City of Columbus, Division of Sewerage and Drainage Waste Water Discharge Permit, Department of Public Utilities.	April 5, 1993	WW
18	Closure Information - Hazardous Waste Storage Tank #100.	No Date	HW
19	Closure Information - Hazardous Waste Storage Tank #108.	No Date	HW
20	Closure Information - Hazardous Waste Storage Tank #243.	No Date	HW

Reference Number	Title	Date	Sort Code
21*	Closure Plan for James Road Hazardous Waste Storage Pad, Hargis & Associates, Inc. (AFP 85 01006).	January 13, 1989	HW
22*	Closure Plan for James Road Hazardous Waste Storage Pad - Amended, Revised February 27, 1991, Revised September 1993,USAF Aeronautical Systems Division.	June 20, 1990	HW
23	Condition Report for Thermodynamics Lab Building 271 Primary Air Compressor manufactured by Ingersoll Rand Manufacturing Company.	July 15, 1992	GEN
24	Crepeau, Thomas E. Manager, Ohio EPA, Letter to John Newman regarding Closure Plan, includes receipt of Hazardous Waste Closure Plan.	August 11, 1989	HW
25	Crepeau, Thomas E. Manager, Ohio EPA, Letter to Robert Lautzenheiser regarding Port Columbus International Airport, includes public notice.	August 11, 1989	GEN
26	Customer Notification and Certification, Laidlaw Environmental Services.	January 10, 1990	HW
27	Department of Air Force, Related Environmental Factors, Chanute AFB, Illinois.	October 1993	REF
28	DERA Restoration Division, Air Force Center for Environmental Excellence, Installation Restoration Program, Environmental Baseline Survey, Phase 1, Air Force Plant 85, Columbus, Ohio.	August 24, 1993	CD
29	Dolan, Michael P., Letter to Debbie Strayton and Andrew Kubalek regarding Testing and Remediation of Contaminated Soil at Port Columbus Taxiway "B".	January 14, 1993	HW
30	Dolan, Michael P., Letter to Debbie Strayton and Andrew Kubalek regarding Testing and Remediation of Contaminated Soil at Port Columbus Taxiway "B".	October 21, 1993	HW
31	Environmental Condition of Property, BRAC Cleanup Plan Guidebook.	Fall 1993	CD
32	Environmental Compliance Assessment and Management Program (ECAMP), Summary for McDonnel Douglas Corporation, AFP 85.	November 18, 1993	CD
32A*	Environmental Compliance Assessment and Management Program (ECAMP), Draft Report, AFP 85.	February 17, 1994	CD
33*	Environmental Risk Information and Imaging Services, ERIIS Report.	March 31, 1994	ADJ
34*	Environmental Assessments, Summary Reports, GOCO Air Force Plants, The Earth Technology Corporation.	August 1989	CD
35	Environmental Assessment, AFP 85, Columbus, Ohio, The Earth Technology Corporation.	December 1988	CD
36*	Environmental Assessment Report, Lawhon & Associates, Inc.	October 1, 1993	CD
37*	Environmental Audit of the AFP 85, Prepared for Douglas Aircraft by Camp Dresser & McKee.	October 1988	CD

Reference Number	Title	Date	Sort Code
38	Evaluation of Process Tank Ventilation Systems and Determination of Possible Air Contaminants, Pedco Inc.	April 1981	A
39	Federal Facility Status Report.	March 15, 1984	GEN
40	Fitch, Richard G., Letter to Michael P. Dolan regarding Taxiway "B" Contaminated Soil and Ohio EPA comment letter.	January 20, 1993	HW
41	Fitch, Richard G., Letter to Michael P. Dolan regarding Taxiway "B" Contaminated Soil Disposal Recommendations.	January 19, 1993	HW
42	FY 94/95 Budget Estimate Submission, FY 96-99 Program Objective Memorandum and FY 93-99 Pollution Prevention POM, McDonnell Douglas Corporation.	March 1992	CD
43	Gerardi, Peter, Letter to Division of State Fire Marshal (Denise Stover) regarding tank closure forms, underground storage tanks at AFP 85.	September 13, 1993	UST
44*	Gill, Kelly, Letter to Peter Gerardi regarding McDonnell Douglas Plant 85.	March 9, 1994	GEN
45*	Hazardous Waste News, Inc., Superfund Update, Business Publishers, Inc.	February 1, 1994	HW
46	Hedrick, Larry, Letter to Jim Opatrny regarding Port Columbus Taxiway "B" Contaminated Soil.	December 23, 1992	HW
47	Holtom, Michele, Ohio EPA, Letter to Carl Stoltz regarding AFP 85.	March 15, 1990	GEN
48	Information on Battery Storage/Inventory.	No Date	HM
49	Initial Pollution Incident Report/Spill Summary, Wesley E. Drake, Central District Office.	1975	REL
50*	Installation Restoration Program, Technical Document to Support No Further Action-Coal Pile, Site 2, Stage 2, AFP 85, Battelle Columbus Division, Final (AFP 85 01003).	January 1989	IRP
51	Installation Restoration Program, Phase II-Confirmation/Quantification, Stage 1, Interim Report, AFP 85, Battelle Memorial Institute/PEI Associates.	May 23, 1986	IRP
52*	Installation Restoration Program Records Search (Phase I) for AFP 85, Ohio, CH2M Hill (AFP 85 01004).	February 1984	IRP
53*	Installation Restoration Program, Phase II-Confirmation/Quantification, Stage 1, Final Report, PEI Associates, Inc./Battelle Columbus Division (AFP 85 01005).	January 1988	IRP
54*	Installation Restoration Program Work Plan, Stage 2, AFP 85, Columbus, Ohio, Battelle Columbus Division, Final.	February 1989	IRP
55	Installation Restoration Program, Phase II, Stage 1 Initial Quantification of Contamination at AFP 85, PEI/Battelle, Sections 3 - 6.	December 1986	IRP
56	Jakeway, Mary, Letter to Mike Zwayer Rockwell International regarding Administrative Order.	May 13, 1986	GEN
57	Kennedy, Robert, Science Application International Corporation, Letter to Julia Hilburn includes responses to comments and environmental review.	November 15, 1989	CD

Reference Number	Title	Date	Sort Code
58	Kroonemeyer, Kent E., Letter to Stephen E. Mooney, O'Brien & Gere Engineers, Inc. United States Fish and Wildlife Service, Reynoldsburg, Ohio.	December 21, 1993	GEN
59	Kubalak, Andrew D., Letter to David Rupert of McDonnell Corporation regarding McDonnell Douglas Generator.	April 27, 1990	GEN
60	Kubalak, Andrew, Letter to Michael P. Dolan regarding Taxiway "B" Soil Remediation.	January 20, 1993	HW
61	Kubalak, Andrew through Lundy Adelsberger, Letter to Randy Meyer through Anthony Sasson regarding Draft Closure Plan approval.	May 11, 1990	HW
62	Lautzenheiser, Robert, Columbus Health Department, Letter to Thomas Crepeau, Ohio EPA regarding storage area includes written closure plan.	June 6, 1989	HW
63	Lautzenheiser, Robert of Columbus Health Department, Letter to Thomas Crepeau regarding Closure Plan.	October 31, 1990	HW
64	Lautzenheiser, Robert of Columbus Health Department, Letter to Thomas Crepeau, Ohio EPA regarding Closure Plan for Port Columbus, Ohio.	March 22, 1993.	CD
65	Laws, Elliot, USEPA Memorandum, Military Base Closures, Guidance on EPA Concurrence in the Identification of Uncontaminated Property Under CERCLA Section 120(h)(4).	April 19, 1994	CD
66*	Limited Phase II Subsurface Investigation, TCA Environmental.	June 17, 1993	UST
67*	Management Action Plan, AFP 85, USAF Environmental Restoration Program.	February 1993	CD
68	Management Action Plan, AFP 85, USAF Environmental Restoration Program.	December 12, 1993	CD
69	Materials List - Storage within Building 10.	No Date	HM
70	McClellan, John, Department of the Air Force to USEPA Region V regarding Response to EPA Region V comments on AFP 85, IRP Stage II Work Plan.	No Date	IRP
71	McMahan, Uylaine E., Letter to Michael Zwayer regarding Notice of Violation.	February 19, 1992	NOV
72	Meyer, Randy through Anthony Sasson, Interoffice communication to Andy Kubalak through Lundy Adelsburger regarding Port Columbus International Airport Closure Plan.	October 31, 1989	CD
73	Micacchion, Mick, Personal communication to Kyle Thomas, O'Brien & Gere Engineers, Inc., Ohio Environmental Protection Agency, Columbus, Ohio.	July 13, 1992	GEN
74*	Ohio EPA, General Permit Authorization to Discharge Storm Water associated with industrial activity under the National Pollutant Discharge Elimination System.	No Date	STW
75	Ohio EPA, Notice of Intent field with OEPA for General Storm Water Discharge Permit.	No Date	STW
76*	Ohio EPA, Letter to Robert Lautzenheiser regarding Closure Plan.	November 1, 1990	HW

Reference Number	Title	Date	Sort Code
77	Ohio EPA, Memorandum to Randy Meyer through Anthony Sasson regarding Closure Plan.	March 22, 1990	HW
78	Ohio EPA, Letter to Robert Lautzenheiser regarding Closure Plan.	September 21, 1990	HW
79	Ohio EPA, Andrew Kubalak through Lundy Adelsberger, Memorandum to Randy Meyer through Anthony Sasson regarding Storage Area Closure Plan.	July 21, 1989	HW
80	OHM Analytical Reports pertaining to UST removals.	No Date	UST
81	Phase I Environmental Audit Report, Metcalf & Eddy, Inc.	August 1991	CD
82	Phase II Environmental Audit Report, Metcalf & Eddy, Inc.	November 1991	CD
83	Photographs, Rockwell International.	July 11, 1983	GEN
84*	Plan: City Water Mains for AFP 85, North American Aviation, Inc.	August 29, 1960	GEN
85	Plan: Cooling Tower Water System for AFP 85, Rockwell International.	December 14, 1984	GEN
86*	Plan: Drainage System (Storm and Sanitary) for AFP 85.	No Date	GEN
87	Plan: Electrical Distribution System for AFP 85, North American Aviation, Inc.	May 8, 1961	GEN
88*	Plan: Natural Gas Distribution System for AFP 85, North American Aviation, Inc.	April 13, 1953	GEN
89	Plan: Plot Plan, Electrical Substations, 4.6 kV & 13.2 kV.	No Date	GEN
90	Plan: Plot Plan of Hazardous Waste Locations for AFP 85, Rockwell International.	April 25, 1986	HW
91	Plan: Steam and Condensate System for AFP 85, North American Aviation, Inc.	June 8, 1952	GEN
92	Plan: Telephone Distribution System for AFP 85, North American Aviation, Inc.	December 14, 1993	GEN
93	Plan: Transformer Vaults and Substations for AFP 85, North American Aviation, Inc.	July 7, 1954	GEN
94	Plan: Underground Sprinkler Mains for AFP 85, North American Aviation, Inc.	October 27, 1952	GEN
95	Plan: Underground Storage Tanks Distribution System for AFP 85, North American Aviation, Inc.	September 5, 1954	UST
96*	Plant Report: Survey for Asbestos Containing Materials at AFP 85, Columbus, Ohio, Volume I of IV, Galson Corporation.	September 27, 1991	AS
97*	Pollution Incident Investigation Report, Defense Construction Supply Center.	November 19, 1975	REL
98	Port Columbus International Airport Closure Plan Extension, Ohio EPA.	July 21, 1993	HW
99	PRC Environmental Management, Inc., RCRA Facility Assessment for the Port Columbus International Airport, Columbus, Ohio.	March 1993	HW
100	Preliminary Review Report, RCRA Facility Assessment, Andrew Kubalak.	1987	HW
101	Rawski, H., Part B Cross Reference Checklist, USEPA Part B Application to Ohio Environmental Protection Agency.	October 16, 1985	HW

Reference Number	Title	Date	Sort Code
102	Rawski, H., Letter to Ohio Environmental Protection Agency Division of Solid and Hazardous Waste Management regarding 1987 Hazardous Waste Report.	February 23, 1988	HW
103*	RCRA Land Disposal Restriction Inspection for McDonnell Douglas Corporation.	April 10, 1990	HW
104	RCRA Land Disposal Restriction Inspection for Rockwell International.	April 10, 1990	HW
105	RCRA Interim Status Inspection Form from McDonnell Douglas Corporation.	April 10-12, 1990	HW
106*	RCRA Facility Assessment RFA, Preliminary Review/Visual Site Inspection, A.T. Kearney.	September 9, 1989	HW
107	Review of Environmental Audit.	December 1993	CD
108	Review of Existing Conditions for M/D Corporation AFP 85, Diagnostics, Volume 1 of 2.	October 12, 1988	CD
109*	RI/FS Phase II, Stage 2A, AFP 85, Final Remedial Investigation/Feasibility Study Addendum, O'Brien & Gere Engineers, Inc.	December 1993	IRP
110	RI/FS, Stage 2, Volume I, Main Report, Final, AFP 85, Decision Documents Science Applications International Corporation.	September 1990	IRP
111	Sasson, Anthony, Interoffice memo to Steve Roth regarding Closure Plan.	June 28, 1989	HW
112	Sasson, Anthony through Ed Kitchen, Interoffice memo to Steve Roth regarding P.C.I.A. Closure Plan.	January 22, 1990	HW
113	Savage, Sally K., Letter to Thomas Reddig, Clydesdale Aircraft Corporation regarding Return to Compliance, Clydesdale Aircraft Corporation.	September 14, 1989	CD
114	Schregardus, Donald, Certified Mail to Robert Lautzenheiser regarding Closure Plan Extension.	July 2, 1991	HW
115*	Science Applications International Corporation, Remedial Investigation/Feasibility Study, Stage 2, Volume 1, Main Report, Final, AFP 85, Columbus, Ohio.	September 1990	IRP
116	Shank, Richard, Ohio EPA, Letter to Robert Lautzenheiser regarding Closure Plan, includes attachments.	June 6, 1990	HW
117	Shank, Richard, Ohio EPA, Letter to Robert Lautzenheiser regarding Closure Plan, includes attachments.	December 19, 1989	HW
118	Sharpenberg, Gractia, Letter to Ms. Williams, OEPA DERR-ERS regarding Spills Requests/PCBs.	August 27, 1993	PCB
119	SPCC Plan - AFP 85, updated.	June 8, 1993	CD
120	Specification No. AF 93-01 for Upgrade of Gasoline Storage Tank, McDonnel Douglas Corporation.	February 8, 1993	UST
121	Statement of Basis AFP 85.	No Date	GEN
122	Storm Water Prevention Plan, AFP 85, McDonnell Douglas Corporation.	March 31, 1993	STW
123	Superfund Amendments and Reauthorization Act (SARA).	No Date	HW

Reference Number	Title	Date	Sort Code
124	Swanson, Sally K., Letter to Jeffrey Gratzer regarding Freedom of Information Act Request, RIN 146-94.	March 28, 1994	CD
125	Terry, Lonnie, Ohio EPA, Letter to Matt Henderson regarding Environmental Baseline Survey.	January 21, 1994	CD
126	Underground Storage Tank Management Plan, Metcalf & Eddy, Inc.	June 10, 1993	UST
127*	Underground Storage Tank (UST) Closure Site Assessment, TCA Environmental.	June 21, 1993	UST
128	Unites Statements Environmental Protection (USEPA), Risk Guidance for Superfund Volume II Environmental Evaluation Manual Interim Final, USEPA, EPA/540/1-89/001, Washington, D.C., 57 pages.	March 1989	CD
129*	U.S. Air Force Category I, No Further Response Action Planned (NFRAP) Document for Site 1, Magnesium Chip Burn Site (WP-04), Air Force Plant 85, Columbus, Ohio.	September 1992	IRP
130*	U.S. Air Force Category I, No Further Response Action Planned (NFRAP) Document for Site 6, Rubble Disposal Site (DP-08), Air Force Plant 85, Columbus, Ohio.	September 1992	IRP
131	U.S. Air Force Category I, No Further Response Action Planned (NFRAP) Document for Site 7, Process Tank Acid Spill (SS-09), Air Force Plant 85, Columbus, Ohio.	September 1992	IRP
133	U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Franklin County, Ohio.	February 1980	GEN
134	U.S. Department of Agriculture, Soil Conservation Service, Prime Farmland Map Units in Franklin County, Ohio.	July 1980	GEN
135	USAF Plant Number 85, Rockwell International (Overview of Facility).	November 1987	GEN
136	USEPA Eastern District Office Inspection Report.	May 17, 1994	CD
137	USEPA Region V, Letter to Robert Lautzenheiser regarding Port Columbus.	May 4, 1992	CD
138*	UST Program Evaluation, Volume I and XII, Hargis & Associates, Inc.	June 2, 1989	UST
139	Various correspondence regarding James Road Hazardous Waste Storage Pad Closure.	--	HW
140	Waste Permit Application Revision No 1, Part B, Department of the Air Force, Brian Kosmal.	June 26, 1985	HW
141*	Water Reuse Study for Naval Weapons Industrial Reserve Plant, Alden E. Stilson & Associates.	May 1973	WW
142	Woischke, Debbie, Letter to Stephen E. Mooney, O'Brien & Gere Engineers, Inc. Ohio Department of Natural Resources, Division of Natural Areas & Preserves, Columbus, Ohio.	December 8, 1993	CD
143	USEPA Region V, Report on Inspection to Determine Compliance with the PCB Disposal and Marking Regulations.	March 28, 1985	PCB
144	WTP - Portions of Operating Manual.	No Date	WW

Reference Number	Title	Date	Sort Code
145	WTP Acid Tank Failure: Closure Report - TCA Environmental; Disposal Analysis - Stilson Laboratories; Acid Tank Failure - Soil Boring Reports 1, 2, and 3, CTL; Engineering July 1991 through January 1992; and Acid Tank Failure - Risk Assessment, Malcolm Pirnie, November 3, 1992.	November 24, 1993	HW
146	WTP - Quarterly Effluent Analysis Reports.	October 1992 through November 1993	WW
147	Installation Restoration Program, Technical Document to Support a Decision of No Further Remedial Action Planned, Site 11, O'Brien & Gere Engineers, Inc.	September 1993	IRP
148	Dolan, Michael, Letter to Dan Gunsett regarding Open Items from October 13, 1993 Meeting regarding Taxiway "B" Contaminated Soil.	October 21, 1993	HW
149	Bowers, Christopher, Letter to Michael Dolan regarding Review of Beling Consultants, Inc.'s Work at Port Columbus.	December 10, 1992	CD
150	Fitch, Richard, Letter to Michael Dolan regarding Taxiway "B" Contaminated Soil Disposal Recommendations.	January 19, 1993	HW
151	Hedrick, Larry, Letter to Jim Opatrny regarding Port Columbus Taxiway "B" Contaminated Soil.	December 23, 1992	HW
152	Stormwater Pollution Prevention Plan, executed April 1, 1993 by Dorris H. Besgrove, Director of Operations Support and Richard W. Ruckman, Senior Manager, Facilities and Maintenance.	April 1, 1993	STW
153*	Draft Environmental Baseline Survey by O'Brien & Gere Engineers, Inc.	October 1995	CD
154	Telephone Conversation with April Lewis, USAF/ASC.	January 1996	GEN
155*	Equipment Pit Inspections, Environmental Baseline Survey, AFP 85.	October 1994	HW
156	Building #208 Decommissioning, McDonnell Douglas Corporation, Facility # C-8, Columbus, Ohio, RMT, Inc., Dublin, Ohio.	October 1994	HW
157*	Building #124 Decommissioning, McDonnell Douglas Corporation, Facility # C-8, Columbus, Ohio, RMT, Inc., Dublin, Ohio.	October 1994	HW
158*	Acid Tank Spill Site Investigation and Characterization at the IWTP, AF Plant 85, Columbus, Ohio, IT Corporation.	September 22, 1995	REL
159*	Ohio EPA Letter to Ali Kahn, ASC/EMC regarding the Acid Tank Spill Site Investigation and Characterization at the IWTP, AF Plant 85, Columbus, Ohio.	November 21, 1995	REL
160	Site Visit, AFP 85, Columbus, Ohio, Earth Tech.	February 1995	GEN
161*	AFP 85 Environmental Compliance Review.	June 28-29, 1995	CD
162*	Mapping Report for USAF, Plant 85, U.S. Fish and Wildlife Service.	September 9, 1994	GEN
163*	Report for Subsurface Investigation, Volume 1 of 2, AFP 85, Site 4 - Fire Training Area, Columbus, Ohio, U.S. Army Corps of Engineers.	January 1996	IRP

Reference Number	Title	Date	Sort Code
164*	Historic Building Inventory and Evaluation of Air Force Plant 85, Columbus, Ohio, Earth Tech.	January 1996	GEN
165	Conversation with Mike Matt.	February 7, 1996	GEN
166	Pesticide Report, CH_2M Hill.	February 1984	PCB
167	Environmental Cleanup Plan, CDRLA004, AFP 85, Columbus International Airport, Columbus, Ohio, OHM Remediation Services Corporation.	January 26, 1996	HW
168*	PCB Evaluation and Decontamination Draft Final Report, AFP 85, Columbus, Ohio, IT Corporation.	December 1995	PCB
169*	Endangered Species Survey, Air Force Plant 85, Draft Installation Report, Parsons Engineering Science, Inc.	May 31, 1995	GEN
170	Conversation with April Lewis, USAF/ASC, regarding PCB-containing transformers and capacitors.	February 1996	PCB
171	ERIIS Data Base Search Report.	1993	CD
172*	Excel spreadsheet (1/17/96) of AFP 85 PCB and PCB contaminated leaker transformers and switches provided by Ali Kahn, ASC/EMC.	January 17, 1996	PCB
173*	AFP 85 PCB Annual Report for 1994, Control of Polychlorinated Biphenyls Toxic Substances Control Act - Part 761.	January 1, 1994 through December 31, 1994	PCB
174*	AFP 85 PCB Annual Report for 1987, Control of Polychlorinated Biphenyls Toxic Substances Control Act - Part 761.	January 1, 1994 through December 31, 1987	PCB
175*	AFP 85 PCB Annual Report for 1989, Control of Polychlorinated Biphenyls Toxic Substances Control Act - Part 761.	January 1, 1989 through February 5, 1990	PCB
176*	AFP 85 PCB Annual Report for 1988, Control of Polychlorinated Biphenyls Toxic Substances Control Act - Part 761.	January 1, 1988 through December 31, 1988	PCB
177*	Excel spreadsheet of AFP 85 Transformers provided by Ali Kahn, ASC/EMC.	January 1996	PCB
178*	Excel spreadsheet of AFP 85 Switches associated with Transformers provided by Ali Kahn, ASC/EMC.	January 1996	PCB
179*	Excel spreadsheet of AFP 85 Transformer and Switch Sample Results Summary provided by Ali Kahn, ASC/EMC.	January 1996	PCB
180*	Excel spreadsheet of AFP 85 Transformers compiled by the Omaha Corps of Engineers and provided by Ali Kahn, ASC/EMC.	June 1996	PCB
181*	Correspondence (E-mail) with Ali Kahn, ASC/EMC, regarding AFP 85 transformers and switches.	May 14, 1996	PCB
182*	Correspondence (E-mail) with Ali Kahn, ASC/EMC, regarding AFP 85 transformers.	June 19, 1996	PCB
183	Conversation with April Lewis, ASC/EMC, regarding the Storm Water Permit at AFP 85.	September 11, 1996	STW
184*	Draft Surface- and Ground-water Monitoring Work Plan, AFP 85, Columbus, Ohio, U.S. Geological Survey, Water Resources Division, Ohio District, Columbus, Ohio.	Revised 6/20/96	IRP
185*	Letter from the Advisory Council on Historic Preservation, Washington, D.C., to Capt. Keysor, Acting Chief of Compliance Division, ASC/EMC, Wright-Patterson AFB, Ohio.	July 17, 1996	GEN

Reference Number	Title	Date	Sort Code
186*	Letter and Inspection Report to Colonel S. Mondl, Director, ASC/EM, Wright-Patterson AFB, Ohio from the NRC, Region III, Lisle, Illinois, pertaining to the NRC inspection of the former North American Aviation Incorporation Site.	April 19, 1996	RM
187*	Memorandum to Mr. J.W. McCormick-Barger, Chief of the Decommissioning Branch, U.S. NRC, Region III, Lisle, Illinois from Richard G. Whitney, Deputy of Acquisition Environmental Management, ASC/EM, Wright-Patterson AFB, Ohio pertaining to the NRC inspection of the former North American Aviation Incorporation Site.	June 12, 1996	RM
188*	Excel spreadsheet of AFP 85 Transformers compiled by Omaha Corps of Engineers and provided by Ali Kahn, ASC/EMC.	September 1996	PCB
189*	Excel spreadsheet of AFP 85 Transformer and Switches provided by Ali Kahn, ASC/EMC.	September 1996	PCB
190	Telephone conversation with April Lewis, ASC/EMC to clarify that transformers 4-TV19, 6-TV14, 6-TV15, 6-TV16, and 3-TV72 are currently being addressed by contractors onsite.	September 1996	PCB
191*	Draft Final Report - PCB Evaluation and Decontamination, USAF Plant #85, Modification P0001, Columbus, Ohio prepared by IT Corporation, 140 Allen's Creek Road, Rochester, New York 14618.	August 1996	PCB
192*	Technical Report for Air Force Plant 85, Building 3, Process Tank Remediation, OHM Remediation Services Corp, Midwest Region.	September 6, 1996	HW
193	Confirmatory Site Visit, AFP 85, Columbus, Ohio, Earth Tech.	October 3, 1996	GEN
194*	Letter to Mr. J.P. Valinsky, Senior Manager, Environmental Services, McDonnel Douglas Aerospace, 5301 Balsa Avenue, Huntington Beach, CA from Kimbra L. Reinhold, Division of Hazardous Waste Management, Central District Office, Ohio EPA, pertaining to Building 124 Closure.	August 20, 1996	HW
195	Telephone message from April Lewis, ASC/EM to clarify that the battery charging area in Building 4 had been cleaned when McDonnell Douglas vacated the plant.	October 7, 1996	HW
196*	Technical Memorandum: Surface and Ground Water Monitoring at Air Force Plant 85, Columbus, OH, prepared by USGS.	March 24, 1997	CD
197*	Letter from Daniel B. Tjoelker, Ohio EPA to Karl Kunas, ASC, concerning the Technical Report for AFP 85 Building 3 Process Tank Remediation.	December 10, 1996	HW
198*	Letter from Karl Kunas, ASC, to Daniel Tjoelker, Ohio EPA, concerning the Technical Report for AFP 85 Building 3 Process Tank Remediation.	January 7, 1997	HW
199	Fact Sheet: The Installation Restoration Program at Air Force Plant 85.	No date	IRP

Reference Number	Title	Date	Sort Code
200*	Real Property documents (transfer letters, deeds, etc.)	No date	RP
201*	Preliminary Draft Environmental Baseline Survey, AFP 85, O'Brien & Gere Engineering.	March 1994	CD
202	Environmental Sampling and Analysis Plan, CFRL A002, AFP 85, prepared by OHM.	October 31, 1995	HW
203	Electric Power System Modernization Study prepared by Gilbert/Commonwealth for Rockwell International.	March 30, 1983	PCB
204*	Response to Request for Proposal for Industrial and Sanitary Sewer Assessment, Plenum Remediation, Former Underground Storage Tank Site, AFP 85, prepared by OHM.	February 18, 1997	CD
208	Fire Training Area Waste Characterization at Air Force Plant 85, prepared by IT Corporation.	May 31, 1994	IRP
205	Statement of Work for Industrial and Sanitary Sewer Assessment, Plenum Remediation, Former Underground Storage Tank Site Remediation/Closure.	January 21, 1997	CD
206	Report of Subsurface Investigation, Volume 2 of 2, Appendix E, Chemical Laboratory Data, AFP 85, Site 4 - Fire Training Area, prepared by U.S. Army Corps of Engineers.	February 1995	IRP
207*(partial copy)	Site 4 - Fire Training Area, AFP 85, Risk Assessment and Risk-based Preliminary Remediation Goals.	June 1994	IRP
208	Installation Assessment of Defense Construction Supply Center, Columbus, OH, Report No. 192.	March, 1981	ADJ
209*	Port Columbus International Airport and tenant spill logs and memoranda concerning spills	many	ADJ
210	Installation Restoration Program Stage 2, Informal Technical Information Report, Analytical Data for Air Force Plant 85, Columbus, Ohio, Battelle Denver Operations	March 31, 1989	IRP
211*	Storage Tank Removal and Installation Program, Quality Assurance Manual (CQAP); Case F-BH, PCB Site #3, Air Force Plant 85, Columbus, Ohio, Specialized Assays, Inc.	April 14, 1995	IRP
212*	PCB Site #3, Project Summary Report, Air Force Plant 85, Columbus, OH, Four Seasons Environmental	July 15, 1994	IRP
213*	Environmental Baseline Survey, AFP 85, Earth Tech	October 1996	CD
214*	Installation Restoration Program, Phase I , R&D Status Report for Plant 85, Columbus, Ohio, Stage 1, Battelle Memorial Institute	February 1986	IRP
215*	Hazardous Ranking System Documentation Report; AFP 85, Columbus, Ohio, USEPA, Region 5	January 1994	IRP
216*	RI/FS, Stage 2, Volume II, Appendices A though G - Part 1, Final, AFP 85, Science Applications International Corporation.	September 1990	IRP
217*	RI/FS, Stage 2, Volume III, Appendices G - Part 2 through K, Final, AFP 85, Science Applications International Corporation.	September 1990	IRP

Reference Number	Title	Date	Sort Code
218*	Finding of No Significant Impact, Disposition of Air Force Plant 85, Columbus, OH, prepared by the US Air Force	April 2, 1996	CD
220	Letter from Daniel B. Tjoelker, Ohio EPA, to April Lewis, U.S Air Force, approving the surface- and ground-water sampling work plan for AFP 85, Columbus, OH	September 27, 1996	IRP
221*	Letter from Daniel B. Tjoelker, Ohio EPA, to April Lewis, U.S Air Force, providing comments on the Report of Subsurface Investigation for IRP Site 4, AFP 85, Columbus, OH	August 2, 1995	IRP
222*	Letter from John W. McClellan, U.S. Air Force, to Jeanne Griffin, U.S. EPA Region V, concerning the request for a PA/SI at AFP 85, Columbus, OH	February 12, 1990	IRP
223	Coal Pile Leachate Analytical Results, IRP Phase II, prepared by Stilson Laboratories	April, 1985	IRP
224*	Letter from Terry Stoddard, U.S. Air Force, to Ed Linville, Ohio EPA, concerning no further action documents for several IRP Sites at AFP 85, Columbus, OH	July 29, 1991	IRP
226*	Memorandum from April Lewis, U.S. Air Force, to Nan Gowda, U.S. EPA Region V, providing the revised surface water and groundwater sampling workplan and a response to Ohio EPA comments	July 30, 1996	IRP
227*	Draft analytical data for PCB remediation at AFP 85 transformers, IT Corp.	June, 1997	PCB
228	Site Visit to AFP 85, Columbus, OH, by Earth Tech	May 19-22, 1997	GEN
229	Application for a Hazardous Waste Storage Facility Permit Part B, AFP 85, Rockwell International	September 12, 1984	HW
230	Waste Permit Application Revision No 2, Part B, Rockwell International	February 13, 1986	HW
231*	Permit to Install, Application No 01-1585, AFP 85, 4 Petroleum Storage Tanks and Gasoline Dispensing Facility, Ohio EPA	November 25, 1987	AST
232*	Memorandum from Andrew D. Kubalak, Ohio EPA DSHWM, to Randy Meyer, Ohio EPA DSHWM, concerning the closure plan for Tank No. 100	September 8, 1988	UST
234*	Letter from B.G. Constantelos, U.S. EPA, to H. Rawski, Rockwell International, concerning the closure plan for Tank No. 100	November 25, 1988	UST
235*	Letter from Andrew Kubulac, Ohio EPA DSHWM, to Thomas Crepeau, Ohio EPA DSHWM, concerning inspection of Tank No. 100 closure activities	May 23, 1989	UST
236*	Letter from Thomas Crepeau, Ohio EPA, to Michael Zawyer, McDonnell-Douglass, stating that closure activities for Tank No. 100 are complete.	June 14, 1989	UST
237*	Letter from H. Rawski, Rockwell International, to Warren Tyler, Ohio EPA, asking for an extension for closure of Tank No. 108.	January 30, 1986	UST

Reference Number	Title	Date	Sort Code
238*	Letter from Thomas Crepeau, Ohio EPA, to Jerry Tucker, Rockwell International, stating that closure activities for Tank No. 108 are complete.	August 18, 1989	UST
239*	Letter from Andrew Kubulac, Ohio EPA DSHWM, to Thomas Crepeau, Ohio EPA DSHWM, concerning inspection of Tank No. 243 closure activities.	January 18.1989	UST
240*	Letter from H. Rawski, Rockwell International, to Thomas Crepeau, Ohio EPA, stating that Tank No. 243 has been closed and providing the consultant's closure certification.	November 14, 1988	UST
241*	Letter from Thomas Crepeau, Ohio EPA, to Lt. Col. Ruppert, U.S. Air Force, stating that closure activities for Tank No. 243 are complete.	February 14, 1989	UST
242*	Restoration of Abandoned Hazardous Waste Storage Sites, Site Plan (map), Floyd Browne Associates Limited.	February 1986	UST
243*	Memorandum from Pete Coutts, IT, to Ali Kahn et al., U.S. Air Force, stating that Ohio EPA TSCA Enforcement has agreed to cleanup levels of 25 ppm in soil and 100 ug/100 cm^2 on concrete surfaces (if they are encapsulated) at AFP 85.	January 21, 1997	PCB
244*	EDR Area Study Report, Environmental Data Resources.	April 30, 1997	ADJ
245*	Fax from Bob Young, IT, to Barbara Young, Earth Tech, listing PCB cleanup sites at which work is in progress.	June 10, 1997	PCB
246	Memorandum from Ronald B. Hale, U.S. Air Force to H. Rawski, Rockwell, concerning restoration of abandoned hazardous waste storage sites, Tank No. 97.	March 28, 1988	HW
248*	Addendum to DO 18, Final Report, Building 3 Sandblast Residue Sampling and Disposal.	June, 1997	RM
249*	Technical Memorandum- Surface and Ground Water Sampling at Air Force Plant 85, Columbus, OH, U.S. Geologic Survey.	May 7, 1997	CD
250*	Project Summary Report, Air Force Plant 85, PCB Site 3, U.S. Army Corps of Engineers, Columbus, OH.	April 4, 1997	IRP
251*	Plot Plan of AFP 85 (map), Rockwell International.	Revised 1973	CD
252*	Zoning Map Number 29 and 30, City of Columbus.	November 12, 1976	GEN
253*	Suspect Oil Contamination AFP 85, Building 125, BHE Environmental.	June 25, 1997	PCB
254*	Building 125 Plumbing Plan and Detail Drawing No. 615410, North American Aviation, Inc.	September 5, 1975	GEN
255*	Amended Closure Plan for James Road Hazardous Waste Storage Pad, U.S. Air Force Plant No. 85, Columbus, Ohio, Rockwell.	February, 1996 (revised) (earlier submittals: 6/20/90, 2/27/91, 7/95)	HW
256*	Subject: User Request - Replace PCB Transformer Project at Air Force Plant 85, Sent from ASC/EM to Larry Leahy (Corps of Eng).	December 16, 1996	PCB

Reference Number	Title	Date	Sort Code
257*	Memorandum from Brad Campbell, Ohio EPA to Royal Lewis, Rockwell, concerning discrepancies in closure plan regarding James Road Hazardous Waste Storage Pad.	August 30, 1990	HW
258*	Memorandum from Brad Campbell thru Lundy Adelsberger, Ohio EPA to Bob Babik, RCRA Engineering Section, concerning discrepancies in closure plan regarding James Road Hazardous Waste Storage Pad.	August 8, 1990	HW
259*	Memorandum from Brad Campbell, Ohio EPA to Royal Lewis, Rockwell, Notice of Deficiency letter regarding the closure plan for the James Road Hazardous Waste Storage Pad.	August 16, 1996	HW
260*	Attachment B - Naturally Occurring Elements or Compounds, AFP 85, Signed by Ohio EPA.	August 30, 1988	HW
261*	Well Log and Drilling Reports, Ohio Department of Natural Resources.	Various	GEN
262*	Groundwater Resources of Franklin County, James J. Schmidt, Ohio Department of Natural Resources.	1993	GEN
263*	Telecon with Bob Young, IT, Earth Tech.	July 24, 1997	PCB
264*	Final Paint Building 5, Plumbing (As-built) DIZW #548472, North American Aviation.	September 9, 1957	GEN
265*	6" Filtered Water from WWTP to Building 6, etc. (As-built), Rockwell.	1978	GEN
266	Building 272 Thermal Chamber, Hazardous Vapor Detection System.	1962	GEN
267*	Addendum to the Environmental Baseline Survey for Air Force Plant 85, Columbus, Ohio, Earth Tech.	December 5, 1997	CD
268*	Provisional Draft of Results of Soil, Groundwater, Surface Water and Streambed-Sediment Sampling at Air Force Plant 85, USGS.	September, 1997	GEN
269*	Site Assessment for Incident No. 2531387, UST 257, AFP 85, OHM.	September 3, 1997	UST
270*	Final Report - PCB Evaluation and Decontamination, Air Force Plant 85, Columbus, Ohio prepared by IT Corporation.	October, 1997	PCB
271*	ASC/EM Review Comments on Provisional Draft of Results of Soil, Groundwater, Surface Water, and Streambed-Sediment Sampling at AFP 85.	September 12, 1997	GEN
272*	ASC/EM Review Comments on PCB Evaluation and Decontamination Project Final Report.	November 14, 1997	PCB
273*	Deed Restriction Language for AFP 85.	November 14, 1997	RP
274*	ASC/EM Guidance for Finalization of Draft Results of Soil, Groundwater, Surface Water, and Streambed-Sediment Sampling at AFP 85.	November 20, 1997	GEN
275*	Letter from Karl Kunas, U.S. Air Force, to Ian Chavez, Limited Liabilities, regarding completion of remedial action at 25 PCB sites.	December 4, 1997	PCB
276*	Plenum Remediation, Industrial and Sanitary Sewer Assessment; and UST Remediation/Closure, Draft Final Report, OHM Remediation.	January 9, 1998 (replacement pages submitted April 21, 1998)	CD

Reference Number	Title	Date	Sort Code
277*	Addendum to Delivery Order 18 Final Report, PCB Evaluation and Decontamination Project, IT Corporation.	April 6, 1998 (original report dated October, 1997)	PCB
278*	Results of Soil, Ground-Water, Surface-Water, and Streambed-Sediment Sampling at Air Force Plant 85, Columbus, OH. Open File Report 97-641. J.M. Parnell, USGS	1997	GEN
279*	Memorandum from Karl Kunas, ASC/EM, to Ian Chavez, USAF, concerning closure of the Jones Road Hazardous Waste Storage Pad (IRP Site 9). (Ohio EPA acceptance of closure attached).	March 17, 1998	IRP
280*	Task Order Final Report – Draft Final Soil Remediation at Air Force Plant 85, Columbus, Ohio, Kelchner Environmental (PCB cleanup at IRP Site 3)	February 13, 1998	IRP
281*	Closure Certification and Final Report, James Road Hazardous Waste Storage Pad, U.S. Air Force Plant No. 85, Columbus, OH, Geraghty & Miller and GMCE	December, 1997	HW
282*	Closure letter from Daniel B. Tjoelker, Ohio EPA, to Karl Kunas, USAF, concerning PCB cleanup at IRP Site 3	April 28, 1998	IRP
283*	Administrative Record, AFP 85 Document Summary, WPAFB	December, 1997	GEN
284*	Letter report from J.J. Ruggles, Rockwell, to Herman F. Scott, Department of the Navy, concerning status and control of PCBs at Plant 85.	January 22, 1980	PCB
285*	List of transformers and PCB concentrations	No Date	PCB
286*	Restoration of Abandoned Hazardous Waste Storage Tanks: individual reports of analytical results, OHM	1987-1988	UST
287*	Letter from John W. McClellan, U.S. Air Force, to Dave Rupert, Rockwell International, identifying soil cleanup goals at AFP 85 of 5ppm for TCE and 50 ppm for TCA	May 6, 1988	UST
288*	Rockwell/OHM Contract Change Agreement, Restore Abandoned Hazardous Waste Storage Sites, including a listing of work completed	May 5, 1988	UST
289*	New tank list for AFP 85, J. LeRose, Rockwell	January 5, 1988	UST
290*	Letter from H. Rawski, Rockwell, to HQ, Aeronautical Systems Division, regarding plans for closure of Tank 97	December 2, 1987	UST
291*	Letter from Jeffrey Stevens, OHM to Jeff LeRose, Rockwell, concerning characteristics and disposal of Tank 287 contents	August 23, 1988	UST
292*	Index to Tanks	No Date	UST
293*	Letter from Ronald B. Hale, U.S. Air Force, to N.H. Leatherman, Rockwell, confirming that the target cleanup level for oil and grease at AFP 85 is 500 ppm	December 18, 1987	UST
294*	Summary of laboratory analyses performed on samples from Restoration of Abandoned Hazardous Waste Storage Tanks project	No Date	UST

Reference Number	Title	Date	Sort Code
295*	Transmittal from Jeff Steven, OHM, to Jeff LeRose, Rockwell with CCN No. 5 Summary attached, identifying analyses conducted and actual amounts of soil removed the Restoration of Abandoned Hazardous Waste Storage Tanks project,	January 13, 1989	UST
296*	Letter from Jeff Steven, OHM, to Jeff LeRose, Rockwell, with CCA No. 4 Summary attached, identifying analyses conducted and actual amounts of soil removed the Restoration of Abandoned Hazardous Waste Storage Tanks project,	November 29, 1988	UST
297*	Field notes on tank excavations signed by Jeff LeRose, Rockwell, and Greg Cooper, OHM	1988, 1989	UST
298*	Letter from Henry Rawski, Rockwell, to Chuck Alfred, U.S. Air Force, requesting guidance on cleanup levels for UST removals	September 14, 1987	UST
299*	Miscellaneous waste profiles from the Restoration of Abandoned Hazardous Waste Storage Tanks project	1988, 1989	UST
300*	Letter from Jeff Stevens, OHM, to John Juniper, Rockwell, concerning tank removal delays	October 5, 1987	UST
301*	Miscellaneous hazardous waste manifests and certificates of disposal from the Restoration of Abandoned Hazardous Waste Storage Tanks project	1988	UST
302*	Letter from N.H. Leatherman, Rockwell, to P.J. Ruppert, U.S. Air Force, concerning cleanup levels for oil and grease at former UST sites.	December 8, 1987	UST
303*	Analytical results of groundwater and soil samples before tank removals for the Restoration of Abandoned Hazardous Waste Storage Tanks project, Floyd Browne Associates	1985	UST
304*	Borehole logs for the Restoration of Abandoned Hazardous Waste Storage Tanks project, Woodward-Clyde Consultants	1985	UST
305*	Meeting notes and attachments for the Restoration of Abandoned Hazardous Waste Storage Tanks project	October 10, 1985	UST
306*	Meeting notes for the Restoration of Abandoned Hazardous Waste Storage Tanks project	May 25, 1988	UST
307*	Specifications for the Restoration of Abandoned Hazardous Waste Storage Tanks project (installation of tanks 544-550)	February 26, 1986	UST
308*	Statement of Work (for Phase II Investigation of Ohio VAP Eligible Properties), AFP 85, Earth Tech	April, 1998	CD
309*	Memorandum from Jeff deRoche, USGS, to Karl Kunas, ASC/EM, concerning the letter to the Aeronautical Systems Center regarding hydrogeology and chemical analyses at AFP 85, Columbus, OH.	January 13, 1998	GEN

Reference Number	Title	Date	Sort Code
310*	AFP 85 site visit and Ohio VAP ineligible site record search, Earth Tech, field notes from personal communication with Pete Gerardi	May18-19, 1998	GEN
311*	Results of PCB analyses of contents of tank 287 and of surrounding soil. Associated correspondence and waste profiles attached.	May 21, 1987	UST
312*	Telephone log of conversation between Mike Zwayer, Rockwell, with Jay Roberts, Floyd Brown Associates, concerning analyses of UST contents and approximate UST installation dates.	April 2, 1986	UST
313*	Schedule of Existing Underground Tanks, including tank contents and dimensions, Floyd Browne Associates.	November 15, 1985	UST
314*	Teleconference between Bob Young, IT, and Robert Sandoli, Earth Tech, concerning PCB remediation activities at MS1, Sub11A, Sub 27, Sub 34, TV17, and TV18.	June 18, 1998	PCB
315*	Ohio Underground Storage Tank Regulations, OAC Rule1301:7-9. Bureau of Underground Storage Tank Regulations, Division of State Fire Marshal, Ohio Department of Commerce.	February 1, 1997	UST
316*	Corrective Action Guidance Document, Bureau of Underground Storage Tank Regulations, Division of State Fire Marshal, Ohio Department of Commerce.	November, 1992	UST
317*	Closure Guidance Document, Bureau of Underground Storage Tank Regulations, Division of State Fire Marshal, Ohio Department of Commerce.	June 1995	UST
318*	Letter from ASC to OEPA regarding clarification to T-Pit and East Bliss Press PCB Evaluation and Decontamination Project	May 13, 1998	PCB
319*	Letter from OEPA to ASC noting concurrence and approval of the revised Addendum to DO18 Final Report PCB Evaluation and Decontamination Project (T-Pit and East Bliss Press)	May 29,1998	PCB
320*	Letter from ASC to OEPA providing revisions to the EBS Addendum and Statement of Work	June 4, 1998	CD
321*	Letter from ASC, to Ian Chavez, Limited Liability, certifying closure of T-Pit	June 1, 1998	PCB
322*	Telecon between Earth Tech and Ray Ladrick, Ohio BUSTR, regarding regulations for investigating VAP ineligible former UST sites	June 17, 1998	UST
323*	Telecon between Earth Tech and Ike Wilder, PCB Unit, Ohio EPA	June 23, 1998	PCB
324*	Letter from ASC to OEPA concerning revisions to the Final Report - Volume I, PCB Evaluation and Decontamination Project, dated October, 1997	December 2, 1997	PCB

Reference Number	Title	Date	Sort Code
325*	Telephone conversation between Earth Tech and Ray Ladrick, Ohio BUSTR, regarding analytical methods required for stoddard solvent	July, 1998	UST
326*	Telephone conversation between Earth Tech and Ray Ladrick, Ohio BUSTR, regarding analytical methods to be used for solvents.	June 26, 1998	UST
327*	Letter from Ohio EPA to Karl Kunas, ASC. Ohio EPA Response to the October 1997 PCB Evaluation and Decontamination Project Report, USAF Plant 85, Columbus, Ohio by IT Corporation.	March 9, 1998	PCB

* = Document located in Earth Tech, Alexandria, Virginia office, AFP 85 files.

Sort Code Key:

A	=	Air	NOV	=	Notice of Violation
ADJ	=	Adjacent Property	PCB	=	Polychlorinated Biphenyl
AS	=	Asbestos	REF	=	Related Environmental Factors
AST	=	Aboveground Storage Tank	REL	=	Release
CD	=	Comprehensive Documents	RM	=	Radioactive Material
GEN	=	General Site Information	RP	=	Real Property
HM	=	Hazardous Material	STW	=	Stormwater
HW	=	Hazardous Waste	UST	=	Underground Storage Tank
IRP	=	Installation Restoration Program	WW	=	Wastewater

Appendix A-2

Sorted by Sort Code

Reference Number	Title	Date	Sort Code
	Air		
4	Air Pollution Study of the Naval Air Industrial Reserve Plant, Columbus, Ohio, Cottrell Environmental Systems.	December 1, 1970	A
5	Air Quality Analysis of a Revised SO2 Emission Limitation in the Ohio State SIP for Rockwell International, HMM Associates.	December 1982	A
8	Application for a permit to operate an air containment source, Ohio Environmental Protection Agency.	March 10, 1983	A
38	Evaluation of Process Tank Ventilation Systems and Determination of Possible Air Contaminants, Pedco Inc.	April 1981	A
	Adjacent Property		
33*	Environmental Risk Information and Imaging Services, ERIIS Report.	March 31, 1994	ADJ
208	Installation Assessment of Defense Construction Supply Center, Columbus, OH, Report No. 192.	March, 1981	ADJ
209*	Port Columbus International Airport and tenant spill logs and memoranda concerning spills	many	ADJ
244*	EDR Area Study Report, Environmental Data Resources.	April 30, 1997	ADJ
	Asbestos		
12*	Asbestos Survey Report, McDonnell Douglas Facility, Prepared for Mosur & Syrakis Co., by Universal Asbestos Management.	August 1989	AS
96*	Plant Report: Survey for Asbestos Containing Materials at AFP 85, Columbus, Ohio, Volume I of IV, Galson Corporation.	September 27, 1991	AS
	Aboveground Storage Tank		
231*	Permit to Install, Application No 01-1585, AFP 85, 4 Petroleum Storage Tanks and Gasoline Dispensing Facility, Ohio EPA	November 25, 1987	AST
	Comprehensive Documents		
28	DERA Restoration Division, Air Force Center for Environmental Excellence, Installation Restoration Program, Environmental Baseline Survey, Phase 1, Air Force Plant 85, Columbus, Ohio.	August 24, 1993	CD
31	Environmental Condition of Property, BRAC Cleanup Plan Guidebook.	Fall 1993	CD
32	Environmental Compliance Assessment and Management Program (ECAMP), Summary for McDonnel Douglas Corporation, AFP 85.	November 18, 1993	CD
32A*	Environmental Compliance Assessment and Management Program (ECAMP), Draft Report, AFP 85.	February 17, 1994	CD

Reference Number	Title	Date	Sort Code
34*	Environmental Assessments, Summary Reports, GOCO Air Force Plants, The Earth Technology Corporation.	August 1989	CD
35	Environmental Assessment, AFP 85, Columbus, Ohio, The Earth Technology Corporation.	December 1988	CD
36*	Environmental Assessment Report, Lawhon & Associates, Inc.	October 1, 1993	CD
37*	Environmental Audit of the AFP 85, Prepared for Douglas Aircraft by Camp Dresser & McKee.	October 1988	CD
42	FY 94/95 Budget Estimate Submission, FY 96-99 Program Objective Memorandum and FY 93-99 Pollution Prevention POM, McDonnell Douglas Corporation.	March 1992	CD
57	Kennedy, Robert, Science Application International Corporation, Letter to Julia Hilburn includes responses to comments and environmental review.	November 15, 1989	CD
64	Lautzenheiser, Robert of Columbus Health Department, Letter to Thomas Crepeau, Ohio EPA regarding Closure Plan for Port Columbus, Ohio.	March 22, 1993.	CD
65	Laws, Elliot, USEPA Memorandum, Military Base Closures, Guidance on EPA Concurrence in the Identification of Uncontaminated Property Under CERCLA Section 120(h)(4).	April 19, 1994	CD
67*	Management Action Plan, AFP 85, USAF Environmental Restoration Program.	February 1993	CD
68	Management Action Plan, AFP 85, USAF Environmental Restoration Program.	December 12, 1993	CD
72	Meyer, Randy through Anthony Sasson, Interoffice communication to Andy Kubalak through Lundy Adelsburger regarding Port Columbus International Airport Closure Plan.	October 31, 1989	CD
81	Phase I Environmental Audit Report, Metcalf & Eddy, Inc.	August 1991	CD
82	Phase II Environmental Audit Report, Metcalf & Eddy, Inc.	November 1991	CD
107	Review of Environmental Audit.	December 1993	CD
108	Review of Existing Conditions for M/D Corporation AFP 85, Diagnostics, Volume 1 of 2.	October 12, 1988	CD
113	Savage, Sally K., Letter to Thomas Reddig, Clydesdale Aircraft Corporation regarding Return to Compliance, Clydesdale Aircraft Corporation.	September 14, 1989	CD
119	SPCC Plan - AFP 85, updated.	June 8, 1993	CD
124	Swanson, Sally K., Letter to Jeffrey Gratzer regarding Freedom of Information Act Request, RIN 146-94.	March 28, 1994	CD
125	Terry, Lonnie, Ohio EPA, Letter to Matt Henderson regarding Environmental Baseline Survey.	January 21, 1994	CD

Reference Number	Title	Date	Sort Code
128	Unites Statements Environmental Protection (USEPA), Risk Guidance for Superfund Volume II Environmental Evaluation Manual Interim Final, USEPA, EPA/540/1-89/001, Washington, D.C., 57 pages.	March 1989	CD
136	USEPA Eastern District Office Inspection Report.	May 17, 1994	CD
137	USEPA Region V, Letter to Robert Lautzenheiser regarding Port Columbus.	May 4, 1992	CD
142	Woischke, Debbie, Letter to Stephen E. Mooney, O'Brien & Gere Engineers, Inc. Ohio Department of Natural Resources, Division of Natural Areas & Preserves, Columbus, Ohio.	December 8, 1993	CD
149	Bowers, Christopher, Letter to Michael Dolan regarding Review of Beling Consultants, Inc.'s Work at Port Columbus.	December 10, 1992	CD
153*	Draft Environmental Baseline Survey by O'Brien & Gere Engineers, Inc.	October 1995	CD
161*	AFP 85 Environmental Compliance Review.	June 28-29, 1995	CD
171	ERIIS Data Base Search Report.	1993	CD
196*	Technical Memorandum: Surface and Ground Water Monitoring at Air Force Plant 85, Columbus, OH, prepared by USGS.	March 24, 1997	CD
201*	Preliminary Draft Environmental Baseline Survey, AFP 85, O'Brien & Gere Engineering.	March 1994	CD
204*	Response to Request for Proposal for Industrial and Sanitary Sewer Assessment, Plenum Remediation, Former Underground Storage Tank Site, AFP 85, prepared by OHM.	February 18, 1997	CD
205	Statement of Work for Industrial and Sanitary Sewer Assessment, Plenum Remediation, Former Underground Storage Tank Site Remediation/Closure.	January 21, 1997	CD
213*	Environmental Baseline Survey, AFP 85, Earth Tech	October 1996	CD
218*	Finding of No Significant Impact, Disposition of Air Force Plant 85, Columbus, OH, prepared by the US Air Force	April 2, 1996	CD
249*	Technical Memorandum- Surface and Ground Water Sampling at Air Force Plant 85, Columbus, OH, U.S. Geologic Survey.	May 7, 1997	CD
251*	Plot Plan of AFP 85 (map), Rockwell International.	Revised 1973	CD
267*	Addendum to the Environmental Baseline Survey for Air Force Plant 85, Columbus, Ohio, Earth Tech.	December 5, 1997	CD
276*	Plenum Remediation, Industrial and Sanitary Sewer Assessment; and UST Remediation/Closure, Draft Final Report, OHM Remediation.	January 9, 1998 (replacement pages submitted April 21, 1998)	CD
308*	Statement of Work (for Phase II Investigation of Ohio VAP Eligible Properties), AFP 85, Earth Tech	April, 1998	CD
320*	Letter from ASC to OEPA providing revisions to the EBS Addendum and Statement of Work	June 4, 1998	CD

Reference Number	Title	Date	Sort Code
	General Site Information		
3	Aerial Photographs received from ODOT and ODNR.	1938, 1949, 1955, 1960, 1963, 1964, 1972, 1979, 1986, 1989, 1994	GEN
9	Appraisal of Transonic/Supersonic Wind Tunnel, AFP 85, International Research & Appraisal Company.	January 30, 1990	GEN
10	Appraisal of Wind Tunnel Disposal Area including a Subsonic and a Transonic/Supersonic Wind Tunnel, Columbus, Ohio, International Research & Appraisal Co.	April 26, 1991	GEN
16	Carlisle, Tom. Letter to George Hamper, Chief of USEPA, Region V, regarding Statement of Basis.	June 2, 1986	GEN
23	Condition Report for Thermodynamics Lab Building 271 Primary Air Compressor manufactured by Ingersoll Rand Manufacturing Company.	July 15, 1992	GEN
25	Crepeau, Thomas E. Manager, Ohio EPA, Letter to Robert Lautzenheiser regarding Port Columbus International Airport, includes public notice.	August 11, 1989	GEN
39	Federal Facility Status Report.	March 15, 1984	GEN
44*	Gill, Kelly, Letter to Peter Gerardi regarding McDonnell Douglas Plant 85.	March 9, 1994	GEN
47	Holtom, Michele, Ohio EPA, Letter to Carl Stoltz regarding AFP 85.	March 15, 1990	GEN
56	Jakeway, Mary, Letter to Mike Zwayer Rockwell International regarding Administrative Order.	May 13, 1986	GEN
58	Kroonemeyer, Kent E., Letter to Stephen E. Mooney, O'Brien & Gere Engineers, Inc. United States Fish and Wildlife Service, Reynoldsburg, Ohio.	December 21, 1993	GEN
59	Kubalak, Andrew D., Letter to David Rupert of McDonnell Corporation regarding McDonnell Douglas Generator.	April 27, 1990	GEN
73	Micacchion, Mick, Personal communication to Kyle Thomas, O'Brien & Gere Engineers, Inc., Ohio Environmental Protection Agency, Columbus, Ohio.	July 13, 1992	GEN
83	Photographs, Rockwell International.	July 11, 1983	GEN
84*	Plan: City Water Mains for AFP 85, North American Aviation, Inc.	August 29, 1960	GEN
85	Plan: Cooling Tower Water System for AFP 85, Rockwell International.	December 14, 1984	GEN
86*	Plan: Drainage System (Storm and Sanitary) for AFP 85.	No Date	GEN
87	Plan: Electrical Distribution System for AFP 85, North American Aviation, Inc.	May 8, 1961	GEN
88*	Plan: Natural Gas Distribution System for AFP 85, North American Aviation, Inc.	April 13, 1953	GEN
89	Plan: Plot Plan, Electrical Substations, 4.6 kV & 13.2 kV.	No Date	GEN
91	Plan: Steam and Condensate System for AFP 85, North American Aviation, Inc.	June 8, 1952	GEN
92	Plan: Telephone Distribution System for AFP 85, North American Aviation, Inc.	December 14, 1993	GEN

Reference Number	Title	Date	Sort Code
93	Plan: Transformer Vaults and Substations for AFP 85, North American Aviation, Inc.	July 7, 1954	GEN
94	Plan: Underground Sprinkler Mains for AFP 85, North American Aviation, Inc.	October 27, 1952	GEN
121	Statement of Basis AFP 85.	No Date	GEN
133	U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Franklin County, Ohio.	February 1980	GEN
134	U.S. Department of Agriculture, Soil Conservation Service, Prime Farmland Map Units in Franklin County, Ohio.	July 1980	GEN
135	USAF Plant Number 85, Rockwell International (Overview of Facility).	November 1987	GEN
154	Telephone Conversation with April Lewis, USAF/ASC.	January 1996	GEN
160	Site Visit, AFP 85, Columbus, Ohio, Earth Tech.	February 1995	GEN
162*	Mapping Report for USAF, Plant 85, U.S. Fish and Wildlife Service.	September 9, 1994	GEN
164*	Historic Building Inventory and Evaluation of Air Force Plant 85, Columbus, Ohio, Earth Tech.	January 1996	GEN
165	Conversation with Mike Matt.	February 7, 1996	GEN
169*	Endangered Species Survey, Air Force Plant 85, Draft Installation Report, Parsons Engineering Science, Inc.	May 31, 1995	GEN
185*	Letter from the Advisory Council on Historic Preservation, Washington, D.C., to Capt. Keysor, Acting Chief of Compliance Division, ASC/EMC, Wright-Patterson AFB, Ohio.	July 17, 1996	GEN
193	Confirmatory Site Visit, AFP 85, Columbus, Ohio, Earth Tech.	October 3, 1996	GEN
228	Site Visit to AFP 85, Columbus, OH, by Earth Tech	May 19-22, 1997	GEN
252*	Zoning Map Number 29 and 30, City of Columbus.	November 12, 1976	GEN
254*	Building 125 Plumbing Plan and Detail Drawing No. 615410, North American Aviation, Inc.	September 5, 1975	GEN
261*	Well Log and Drilling Reports, Ohio Department of Natural Resources.	Various	GEN
262*	Groundwater Resources of Franklin County, James J. Schmidt, Ohio Department of Natural Resources.	1993	GEN
264*	Final Paint Building 5, Plumbing (As-built) DIZW #548472, North American Aviation.	September 9, 1957	GEN
265*	6" Filtered Water from WWTP to Building 6, etc. (As-built), Rockwell.	1978	GEN
266	Building 272 Thermal Chamber, Hazardous Vapor Detection System.	1962	GEN
268*	Provisional Draft of Results of Soil, Groundwater, Surface Water and Streambed-Sediment Sampling at Air Force Plant 85, USGS.	September, 1997	GEN
271*	ASC/EM Review Comments on Provisional Draft of Results of Soil, Groundwater, Surface Water, and Streambed-Sediment Sampling at AFP 85.	September 12, 1997	GEN

Reference Number	Title	Date	Sort Code
274*	ASC/EM Guidance for Finalization of Draft Results of Soil, Groundwater, Surface Water, and Streambed-Sediment Sampling at AFP 85.	November 20, 1997	GEN
278*	Results of Soil, Ground-Water, Surface-Water, and Streambed-Sediment Sampling at Air Force Plant 85, Columbus, OH. Open File Report 97-641. J.M. Parnell, USGS	1997	GEN
283*	Administrative Record, AFP 85 Document Summary, WPAFB	December, 1997	GEN
309*	Memorandum from Jeff deRoche, USGS, to Karl Kunas, ASC/EM, concerning the letter to the Aeronautical Systems Center regarding hydrogeology and chemical analyses at AFP 85, Columbus, OH.	January 13, 1998	GEN
310*	AFP 85 site visit and Ohio VAP ineligible site record search, Earth Tech, field notes from personal communication with Pete Gerardi	May18-19, 1998	GEN
Hazardous Material			
48	Information on Battery Storage/Inventory.	No Date	HM
69	Materials List - Storage within Building 10.	No Date	HM
Hazardous Waste			
18	Closure Information - Hazardous Waste Storage Tank #100.	No Date	HW
19	Closure Information - Hazardous Waste Storage Tank #108.	No Date	HW
20	Closure Information - Hazardous Waste Storage Tank #243.	No Date	HW
21*	Closure Plan for James Road Hazardous Waste Storage Pad, Hargis & Associates, Inc. (AFP 85 01006).	January 13, 1989	HW
22*	Closure Plan for James Road Hazardous Waste Storage Pad - Amended, Revised February 27, 1991, Revised September 1993,USAF Aeronautical Systems Division.	June 20, 1990	HW
24	Crepeau, Thomas E. Manager, Ohio EPA, Letter to John Newman regarding Closure Plan, includes receipt of Hazardous Waste Closure Plan.	August 11, 1989	HW
26	Customer Notification and Certification, Laidlaw Environmental Services.	January 10, 1990	HW
29	Dolan, Michael P., Letter to Debbie Strayton and Andrew Kubalek regarding Testing and Remediation of Contaminated Soil at Port Columbus Taxiway "B".	January 14, 1993	HW
30	Dolan, Michael P., Letter to Debbie Strayton and Andrew Kubalek regarding Testing and Remediation of Contaminated Soil at Port Columbus Taxiway "B".	October 21, 1993	HW
40	Fitch, Richard G., Letter to Michael P. Dolan regarding Taxiway "B" Contaminated Soil and Ohio EPA comment letter.	January 20, 1993	HW
41	Fitch, Richard G., Letter to Michael P. Dolan regarding Taxiway "B" Contaminated Soil Disposal Recommendations.	January 19, 1993	HW
45*	Hazardous Waste News, Inc., Superfund Update, Business Publishers, Inc.	February 1, 1994	HW
46	Hedrick, Larry, Letter to Jim Opatrny regarding Port Columbus Taxiway "B" Contaminated Soil.	December 23, 1992	HW

Reference Number	Title	Date	Sort Code
60	Kubalak, Andrew, Letter to Michael P. Dolan regarding Taxiway "B" Soil Remediation.	January 20, 1993	HW
61	Kubalak, Andrew through Lundy Adelsberger, Letter to Randy Meyer through Anthony Sasson regarding Draft Closure Plan approval.	May 11, 1990	HW
62	Lautzenheiser, Robert, Columbus Health Department, Letter to Thomas Crepeau, Ohio EPA regarding storage area includes written closure plan.	June 6, 1989	HW
63	Lautzenheiser, Robert of Columbus Health Department, Letter to Thomas Crepeau regarding Closure Plan.	October 31, 1990	HW
76*	Ohio EPA, Letter to Robert Lautzenheiser regarding Closure Plan.	November 1, 1990	HW
77	Ohio EPA, Memorandum to Randy Meyer through Anthony Sasson regarding Closure Plan.	March 22, 1990	HW
78	Ohio EPA, Letter to Robert Lautzenheiser regarding Closure Plan.	September 21, 1990	HW
79	Ohio EPA, Andrew Kubalak through Lundy Adelsberger, Memorandum to Randy Meyer through Anthony Sasson regarding Storage Area Closure Plan.	July 21, 1989	HW
90	Plan: Plot Plan of Hazardous Waste Locations for AFP 85, Rockwell International.	April 25, 1986	HW
98	Port Columbus International Airport Closure Plan Extension, Ohio EPA.	July 21, 1993	HW
99	PRC Environmental Management, Inc., RCRA Facility Assessment for the Port Columbus International Airport, Columbus, Ohio.	March 1993	HW
100	Preliminary Review Report, RCRA Facility Assessment, Andrew Kubalak.	1987	HW
101	Rawski, H., Part B Cross Reference Checklist, USEPA Part B Application to Ohio Environmental Protection Agency.	October 16, 1985	HW
102	Rawski, H., Letter to Ohio Environmental Protection Agency Division of Solid and Hazardous Waste Management regarding 1987 Hazardous Waste Report.	February 23, 1988	HW
103*	RCRA Land Disposal Restriction Inspection for McDonnell Douglas Corporation.	April 10, 1990	HW
104	RCRA Land Disposal Restriction Inspection for Rockwell International.	April 10, 1990	HW
105	RCRA Interim Status Inspection Form from McDonnell Douglas Corporation.	April 10-12, 1990	HW
106*	RCRA Facility Assessment RFA, Preliminary Review/Visual Site Inspection, A.T. Kearney.	September 9, 1989	HW
111	Sasson, Anthony, Interoffice memo to Steve Roth regarding Closure Plan.	June 28, 1989	HW
112	Sasson, Anthony through Ed Kitchen, Interoffice memo to Steve Roth regarding P.C.I.A. Closure Plan.	January 22, 1990	HW
114	Schregardus, Donald, Certified Mail to Robert Lautzenheiser regarding Closure Plan Extension.	July 2, 1991	HW
116	Shank, Richard, Ohio EPA, Letter to Robert Lautzenheiser regarding Closure Plan, includes attachments.	June 6, 1990	HW

Reference Number	Title	Date	Sort Code
117	Shank, Richard, Ohio EPA, Letter to Robert Lautzenheiser regarding Closure Plan, includes attachments.	December 19, 1989	HW
123	Superfund Amendments and Reauthorization Act (SARA).	No Date	HW
139	Various correspondence regarding James Road Hazardous Waste Storage Pad Closure.	--	HW
140	Waste Permit Application Revision No 1, Part B, Department of the Air Force, Brian Kosmal.	June 26, 1985	HW
145	WTP Acid Tank Failure: Closure Report - TCA Environmental; Disposal Analysis - Stilson Laboratories; Acid Tank Failure - Soil Boring Reports 1, 2, and 3, CTL; Engineering July 1991 through January 1992; and Acid Tank Failure - Risk Assessment, Malcolm Pirnie, November 3, 1992.	November 24, 1993	HW
148	Dolan, Michael, Letter to Dan Gunsett regarding Open Items from October 13, 1993 Meeting regarding Taxiway "B" Contaminated Soil.	October 21, 1993	HW
150	Fitch, Richard, Letter to Michael Dolan regarding Taxiway "B" Contaminated Soil Disposal Recommendations.	January 19, 1993	HW
151	Hedrick, Larry, Letter to Jim Opatrny regarding Port Columbus Taxiway "B" Contaminated Soil.	December 23, 1992	HW
155*	Equipment Pit Inspections, Environmental Baseline Survey, AFP 85.	October 1994	HW
156	Building #208 Decommissioning, McDonnell Douglas Corporation, Facility # C-8, Columbus, Ohio, RMT, Inc., Dublin, Ohio.	October 1994	HW
157*	Building #124 Decommissioning, McDonnell Douglas Corporation, Facility # C-8, Columbus, Ohio, RMT, Inc., Dublin, Ohio.	October 1994	HW
167	Environmental Cleanup Plan, CDRLA004, AFP 85, Columbus International Airport, Columbus, Ohio, OHM Remediation Services Corporation.	January 26, 1996	HW
192*	Technical Report for Air Force Plant 85, Building 3, Process Tank Remediation, OHM Remediation Services Corp, Midwest Region.	September 6, 1996	HW
194*	Letter to Mr. J.P. Valinsky, Senior Manager, Environmental Services, McDonnel Douglas Aerospace, 5301 Balsa Avenue, Huntington Beach, CA from Kimbra L. Reinhold, Division of Hazardous Waste Management, Central District Office, Ohio EPA, pertaining to Building 124 Closure.	August 20, 1996	HW
195	Telephone message from April Lewis, ASC/EM to clarify that the battery charging area in Building 4 had been cleaned when McDonnell Douglas vacated the plant.	October 7, 1996	HW
197*	Letter from Daniel B. Tjoelker, Ohio EPA to Karl Kunas, ASC, concerning the Technical Report for AFP 85 Building 3 Process Tank Remediation.	December 10, 1996	HW
198*	Letter from Karl Kunas, ASC, to Daniel Tjoelker, Ohio EPA, concerning the Technical Report for AFP 85 Building 3 Process Tank Remediation.	January 7, 1997	HW

Reference Number	Title	Date	Sort Code
202	Environmental Sampling and Analysis Plan, CFRL A002, AFP 85, prepared by OHM.	October 31, 1995	HW
229	Application for a Hazardous Waste Storage Facility Permit Part B, AFP 85, Rockwell International	September 12, 1984	HW
230	Waste Permit Application Revision No 2, Part B, Rockwell International	February 13, 1986	HW
246	Memorandum from Ronald B. Hale, U.S. Air Force to H. Rawski, Rockwell, concerning restoration of abandoned hazardous waste storage sites, Tank No. 97.	March 28, 1988	HW
255*	Amended Closure Plan for James Road Hazardous Waste Storage Pad, U.S. Air Force Plant No. 85, Columbus, Ohio, Rockwell.	February, 1996 (revised) (earlier submittals: 6/20/90, 2/27/91, 7/95)	HW
257*	Memorandum from Brad Campbell, Ohio EPA to Royal Lewis, Rockwell, concerning discrepancies in closure plan regarding James Road Hazardous Waste Storage Pad.	August 30, 1990	HW
258*	Memorandum from Brad Campbell thru Lundy Adelsberger, Ohio EPA to Bob Babik, RCRA Engineering Section, concerning discrepancies in closure plan regarding James Road Hazardous Waste Storage Pad.	August 8, 1990	HW
259*	Memorandum from Brad Campbell, Ohio EPA to Royal Lewis, Rockwell, Notice of Deficiency letter regarding the closure plan for the James Road Hazardous Waste Storage Pad.	August 16, 1996	HW
260*	Attachment B - Naturally Occurring Elements or Compounds, AFP 85, Signed by Ohio EPA.	August 30, 1988	HW
281*	Closure Certification and Final Report, James Road Hazardous Waste Storage Pad, U.S. Air Force Plant No. 85, Columbus, OH, Geraghty & Miller and GMCE	December, 1997	HW
Installation Restoration Program			
50*	Installation Restoration Program, Technical Document to Support No Further Action-Coal Pile, Site 2, Stage 2, AFP 85, Battelle Columbus Division, Final (AFP 85 01003).	January 1989	IRP
51	Installation Restoration Program, Phase II-Confirmation/Quantification, Stage 1, Interim Report, AFP 85, Battelle Memorial Institute/PEI Associates.	May 23, 1986	IRP
52*	Installation Restoration Program Records Search (Phase I) for AFP 85, Ohio, CH2M Hill (AFP 85 01004).	February 1984	IRP
53*	Installation Restoration Program, Phase II-Confirmation/Quantification, Stage 1, Final Report, PEI Associates, Inc./Battelle Columbus Division (AFP 85 01005).	January 1988	IRP
54*	Installation Restoration Program Work Plan, Stage 2, AFP 85, Columbus, Ohio, Battelle Columbus Division, Final.	February 1989	IRP
55	Installation Restoration Program, Phase II, Stage 1 Initial Quantification of Contamination at AFP 85, PEI/Battelle, Sections 3 - 6.	December 1986	IRP

Reference Number	Title	Date	Sort Code
70	McClellan, John, Department of the Air Force to USEPA Region V regarding Response to EPA Region V comments on AFP 85, IRP Stage II Work Plan.	No Date	IRP
109*	RI/FS Phase II, Stage 2A, AFP 85, Final Remedial Investigation/Feasibility Study Addendum, O'Brien & Gere Engineers, Inc.	December 1993	IRP
110	RI/FS, Stage 2, Volume I, Main Report, Final, AFP 85, Decision Documents Science Applications International Corporation.	September 1990	IRP
115*	Science Applications International Corporation, Remedial Investigation/Feasibility Study, Stage 2, Volume 1, Main Report, Final, AFP 85, Columbus, Ohio.	September 1990	IRP
129*	U.S. Air Force Category I, No Further Response Action Planned (NFRAP) Document for Site 1, Magnesium Chip Burn Site (WP-04), Air Force Plant 85, Columbus, Ohio.	September 1992	IRP
130*	U.S. Air Force Category I, No Further Response Action Planned (NFRAP) Document for Site 6, Rubble Disposal Site (DP-08), Air Force Plant 85, Columbus, Ohio.	September 1992	IRP
131	U.S. Air Force Category I, No Further Response Action Planned (NFRAP) Document for Site 7, Process Tank Acid Spill (SS-09), Air Force Plant 85, Columbus, Ohio.	September 1992	IRP
147	Installation Restoration Program, Technical Document to Support a Decision of No Further Remedial Action Planned, Site 11, O'Brien & Gere Engineers, Inc.	September 1993	IRP
163*	Report for Subsurface Investigation, Volume 1 of 2, AFP 85, Site 4 - Fire Training Area, Columbus, Ohio, U.S. Army Corps of Engineers.	January 1996	IRP
184*	Draft Surface- and Ground-water Monitoring Work Plan, AFP 85, Columbus, Ohio, U.S. Geological Survey, Water Resources Division, Ohio District, Columbus, Ohio.	Revised 6/20/96	IRP
199	Fact Sheet: The Installation Restoration Program at Air Force Plant 85.	No date	IRP
208	Fire Training Area Waste Characterization at Air Force Plant 85, prepared by IT Corporation.	May 31, 1994	IRP
206	Report of Subsurface Investigation, Volume 2 of 2, Appendix E, Chemical Laboratory Data, AFP 85, Site 4 - Fire Training Area, prepared by U.S. Army Corps of Engineers.	February 1995	IRP
207*(partial copy)	Site 4 - Fire Training Area, AFP 85, Risk Assessment and Risk-based Preliminary Remediation Goals.	June 1994	IRP
210	Installation Restoration Program Stage 2, Informal Technical Information Report, Analytical Data for Air Force Plant 85, Columbus, Ohio, Battelle Denver Operations	March 31, 1989	IRP
211*	Storage Tank Removal and Installation Program, Quality Assurance Manual (CQAP); Case F-BH, PCB Site #3, Air Force Plant 85, Columbus, Ohio, Specialized Assays, Inc.	April 14, 1995	IRP

Reference Number	Title	Date	Sort Code
212*	PCB Site #3, Project Summary Report, Air Force Plant 85, Columbus, OH, Four Seasons Environmental	July 15, 1994	IRP
214*	Installation Restoration Program, Phase I , R&D Status Report for Plant 85, Columbus, Ohio, Stage 1, Battelle Memorial Institute	February 1986	IRP
215*	Hazardous Ranking System Documentation Report; AFP 85, Columbus, Ohio, USEPA, Region 5	January 1994	IRP
216*	RI/FS, Stage 2, Volume II, Appendices A though G - Part 1, Final, AFP 85, Science Applications International Corporation.	September 1990	IRP
217*	RI/FS, Stage 2, Volume III, Appendices G - Part 2 through K, Final, AFP 85, Science Applications International Corporation.	September 1990	IRP
220	Letter from Daniel B. Tjoelker, Ohio EPA, to April Lewis, U.S Air Force, approving the surface- and ground-water sampling work plan for AFP 85, Columbus, OH	September 27, 1996	IRP
221*	Letter from Daniel B. Tjoelker, Ohio EPA, to April Lewis, U.S Air Force, providing comments on the Report of Subsurface Investigation for IRP Site 4, AFP 85, Columbus, OH	August 2, 1995	IRP
222*	Letter from John W. McClellan, U.S. Air Force, to Jeanne Griffin, U.S. EPA Region V, concerning the request for a PA/SI at AFP 85, Columbus, OH	February 12, 1990	IRP
223	Coal Pile Leachate Analytical Results, IRP Phase II, prepared by Stilson Laboratories	April, 1985	IRP
224*	Letter from Terry Stoddard, U.S. Air Force, to Ed Linville, Ohio EPA, concerning no further action documents for several IRP Sites at AFP 85, Columbus, OH	July 29, 1991	IRP
226*	Memorandum from April Lewis, U.S. Air Force, to Nan Gowda, U.S. EPA Region V, providing the revised surface water and groundwater sampling workplan and a response to Ohio EPA comments	July 30, 1996	IRP
250*	Project Summary Report, Air Force Plant 85, PCB Site 3, U.S. Army Corps of Engineers, Columbus, OH.	April 4, 1997	IRP
279*	Memorandum from Karl Kunas, ASC/EM, to Ian Chavez, USAF, concerning closure of the Jones Road Hazardous Waste Storage Pad (IRP Site 9). (Ohio EPA acceptance of closure attached).	March 17, 1998	IRP
280*	Task Order Final Report – Draft Final Soil Remediation at Air Force Plant 85, Columbus, Ohio, Kelchner Environmental (PCB cleanup at IRP Site 3)	February 13, 1998	IRP
282*	Closure letter from Daniel B. Tjoelker, Ohio EPA, to Karl Kunas, USAF, concerning PCB cleanup at IRP Site 3	April 28, 1998	IRP
	Notice of Violation		
13	Besgrove, Dorris, Letter to Uylaine E. McMahan, Chief, Ohio Environmental Agency, Regarding Notice of Violation, McDonnell Douglas Corporation, OH171700890004.	February 28, 1992	NOV

Reference Number	Title	Date	Sort Code
14	Bowers, Christopher L., Letter to Uylaine E. McMahan, Chief, Ohio Environmental Agency, Regarding Notice of Violation, McDonnell Douglas Corporation, OH17170090004.	December 10, 1992	NOV
71	McMahan, Uylaine E., Letter to Michael Zwayer regarding Notice of Violation.	February 19, 1992	NOV
	Polychlorinated Biphenyl		
6	AFP 85 PCB Annual Report for 1981, Control of PCBs, TSCA - Part 761.	January 1, 1981 through December 31, 1981	PCB
7	AFP 85 PCB Annual Report for 1992, Control of PCBs, TSCA - Part 761.	January 1, 1992 through December 31, 1992	PCB
118	Sharpenberg, Gractia, Letter to Ms. Williams, OEPA DERR-ERS regarding Spills Requests/PCBs.	August 27, 1993	PCB
143	USEPA Region V, Report on Inspection to Determine Compliance with the PCB Disposal and Marking Regulations.	March 28, 1985	PCB
166	Pesticide Report, CH_2M Hill.	February 1984	PCB
168*	PCB Evaluation and Decontamination Draft Final Report, AFP 85, Columbus, Ohio, IT Corporation.	December 1995	PCB
170	Conversation with April Lewis, USAF/ASC, regarding PCB-containing transformers and capacitors.	February 1996	PCB
172*	Excel spreadsheet (1/17/96) of AFP 85 PCB and PCB contaminated leaker transformers and switches provided by Ali Kahn, ASC/EMC.	January 17, 1996	PCB
173*	AFP 85 PCB Annual Report for 1994, Control of Polychlorinated Biphenyls Toxic Substances Control Act - Part 761.	January 1, 1994 through December 31, 1994	PCB
174*	AFP 85 PCB Annual Report for 1987, Control of Polychlorinated Biphenyls Toxic Substances Control Act - Part 761.	January 1, 1994 through December 31, 1987	PCB
175*	AFP 85 PCB Annual Report for 1989, Control of Polychlorinated Biphenyls Toxic Substances Control Act - Part 761.	January 1, 1989 through February 5, 1990	PCB
176*	AFP 85 PCB Annual Report for 1988, Control of Polychlorinated Biphenyls Toxic Substances Control Act - Part 761.	January 1, 1988 through December 31, 1988	PCB
177*	Excel spreadsheet of AFP 85 Transformers provided by Ali Kahn, ASC/EMC.	January 1996	PCB
178*	Excel spreadsheet of AFP 85 Switches associated with Transformers provided by Ali Kahn, ASC/EMC.	January 1996	PCB
179*	Excel spreadsheet of AFP 85 Transformer and Switch Sample Results Summary provided by Ali Kahn, ASC/EMC.	January 1996	PCB
180*	Excel spreadsheet of AFP 85 Transformers compiled by the Omaha Corps of Engineers and provided by Ali Kahn, ASC/EMC.	June 1996	PCB
181*	Correspondence (E-mail) with Ali Kahn, ASC/EMC, regarding AFP 85 transformers and switches.	May 14, 1996	PCB
182*	Correspondence (E-mail) with Ali Kahn, ASC/EMC, regarding AFP 85 transformers.	June 19, 1996	PCB
188*	Excel spreadsheet of AFP 85 Transformers compiled by Omaha Corps of Engineers and provided by Ali Kahn, ASC/EMC.	September 1996	PCB

Reference Number	Title	Date	Sort Code
189*	Excel spreadsheet of AFP 85 Transformer and Switches provided by Ali Kahn, ASC/EMC.	September 1996	PCB
190	Telephone conversation with April Lewis, ASC/EMC to clarify that transformers 4-TV19, 6-TV14, 6-TV15, 6-TV16, and 3-TV72 are currently being addressed by contractors onsite.	September 1996	PCB
191*	Draft Final Report - PCB Evaluation and Decontamination, USAF Plant #85, Modification P0001, Columbus, Ohio prepared by IT Corporation, 140 Allen's Creek Road, Rochester, New York 14618.	August 1996	PCB
203	Electric Power System Modernization Study prepared by Gilbert/Commonwealth for Rockwell International.	March 30, 1983	PCB
227*	Draft analytical data for PCB remediation at AFP 85 transformers, IT Corp.	June, 1997	PCB
243*	Memorandum from Pete Coutts, IT, to Ali Kahn et al., U.S. Air Force, stating that Ohio EPA TSCA Enforcement has agreed to cleanup levels of 25 ppm in soil and 100 ug/100 cm^2 on concrete surfaces (if they are encapsulated) at AFP 85.	January 21, 1997	PCB
245*	Fax from Bob Young, IT, to Barbara Young, Earth Tech, listing PCB cleanup sites at which work is in progress.	June 10, 1997	PCB
253*	Suspect Oil Contamination AFP 85, Building 125, BHE Environmental.	June 25, 1997	PCB
256*	Subject: User Request - Replace PCB Transformer Project at Air Force Plant 85, Sent from ASC/EM to Larry Leahy (Corps of Eng).	December 16, 1996	PCB
263*	Telecon with Bob Young, IT, Earth Tech.	July 24, 1997	PCB
270*	Final Report - PCB Evaluation and Decontamination, Air Force Plant 85, Columbus, Ohio prepared by IT Corporation.	October, 1997	PCB
272*	ASC/EM Review Comments on PCB Evaluation and Decontamination Project Final Report.	November 14, 1997	PCB
275*	Letter from Karl Kunas, U.S. Air Force, to Ian Chavez, Limited Liabilities, regarding completion of remedial action at 25 PCB sites.	December 4, 1997	PCB
277*	Addendum to Delivery Order 18 Final Report, PCB Evaluation and Decontamination Project, IT Corporation.	April 6, 1998 (original report dated October, 1997)	PCB
284*	Letter report from J.J. Ruggles, Rockwell, to Herman F. Scott, Department of the Navy, concerning status and control of PCBs at Plant 85.	January 22, 1980	PCB
285*	List of transformers and PCB concentrations	No Date	PCB
314*	Teleconference between Bob Young, IT, and Robert Sandoli, Earth Tech, concerning PCB remediation activities at MS1, Sub11A, Sub 27, Sub 34, TV17, and TV18.	June 18, 1998	PCB
318*	Letter from ASC to OEPA regarding clarification to T-Pit and East Bliss Press PCB Evaluation and Decontamination Project	May 13, 1998	PCB

Reference Number	Title	Date	Sort Code
319*	Letter from OEPA to ASC noting concurrence and approval of the revised Addendum to DO18 Final Report PCB Evaluation and Decontamination Project (T-Pit and East Bliss Press)	May 29,1998	PCB
321*	Letter from ASC, to Ian Chavez, Limited Liability, certifying closure of T-Pit	June 1, 1998	PCB
323*	Telecon between Earth Tech and Ike Wilder, PCB Unit, Ohio EPA	June 23, 1998	PCB
324*	Letter from ASC to OEPA concerning revisions to the Final Report - Volume I, PCB Evaluation and Decontamination Project, dated October, 1997	December 2, 1997	PCB
327*	Letter from Ohio EPA to Karl Kunas, ASC. Ohio EPA Response to the October 1997 PCB Evaluation and Decontamination Project Report, USAF Plant 85, Columbus, Ohio by IT Corporation.	March 9, 1998	PCB
Related Environmental Factors			
27	Department of Air Force, Related Environmental Factors, Chanute AFB, Illinois.	October 1993	REF
Release			
49	Initial Pollution Incident Report/Spill Summary, Wesley E. Drake, Central District Office.	1975	REL
97*	Pollution Incident Investigation Report, Defense Construction Supply Center.	November 19, 1975	REL
158*	Acid Tank Spill Site Investigation and Characterization at the IWTP, AF Plant 85, Columbus, Ohio, IT Corporation.	September 22, 1995	REL
159*	Ohio EPA Letter to Ali Kahn, ASC/EMC regarding the Acid Tank Spill Site Investigation and Characterization at the IWTP, AF Plant 85, Columbus, Ohio.	November 21, 1995	REL
Radioactive Material			
186*	Letter and Inspection Report to Colonel S. Mondl, Director, ASC/EM, Wright-Patterson AFB, Ohio from the NRC, Region III, Lisle, Illinois, pertaining to the NRC inspection of the former North American Aviation Incorporation Site.	April 19, 1996	RM
187*	Memorandum to Mr. J.W. McCormick-Barger, Chief of the Decommissioning Branch, U.S. NRC, Region III, Lisle, Illinois from Richard G. Whitney, Deputy of Acquisition Environmental Management, ASC/EM, Wright-Patterson AFB, Ohio pertaining to the NRC inspection of the former North American Aviation Incorporation Site.	June 12, 1996	RM
248*	Addendum to DO 18, Final Report, Building 3 Sandblast Residue Sampling and Disposal.	June, 1997	RM
Real Property			
11	Appraisal of 38.38 acre tract of land, AFP 85, International Research & Appraisal Co.	March 21, 1991	RP
200*	Real Property documents (transfer letters, deeds, etc.)	No date	RP
273*	Deed Restriction Language for AFP 85.	November 14, 1997	RP

Reference Number	Title	Date	Sort Code
	Stormwater		
74*	Ohio EPA, General Permit Authorization to Discharge Storm Water associated with industrial activity under the National Pollutant Discharge Elimination System.	No Date	STW
75	Ohio EPA, Notice of Intent field with OEPA for General Storm Water Discharge Permit.	No Date	STW
122	Storm Water Prevention Plan, AFP 85, McDonnell Douglas Corporation.	March 31, 1993	STW
152	Stormwater Pollution Prevention Plan, executed April 1, 1993 by Dorris H. Besgrove, Director of Operations Support and Richard W. Ruckman, Senior Manager, Facilities and Maintenance.	April 1, 1993	STW
183	Conversation with April Lewis, ASC/EMC, regarding the Storm Water Permit at AFP 85.	September 11, 1996	STW
	Underground Storage Tank		
43	Gerardi, Peter, Letter to Division of State Fire Marshal (Denise Stover) regarding tank closure forms, underground storage tanks at AFP 85.	September 13, 1993	UST
66*	Limited Phase II Subsurface Investigation, TCA Environmental.	June 17, 1993	UST
80	OHM Analytical Reports pertaining to UST removals.	No Date	UST
95	Plan: Underground Storage Tanks Distribution System for AFP 85, North American Aviation, Inc.	September 5, 1954	UST
120	Specification No. AF 93-01 for Upgrade of Gasoline Storage Tank, McDonnel Douglas Corporation.	February 8, 1993	UST
126	Underground Storage Tank Management Plan, Metcalf & Eddy, Inc.	June 10, 1993	UST
127*	Underground Storage Tank (UST) Closure Site Assessment, TCA Environmental.	June 21, 1993	UST
138*	UST Program Evaluation, Volume I and XII, Hargis & Associates, Inc.	June 2, 1989	UST
232*	Memorandum from Andrew D. Kubalak, Ohio EPA DSHWM, to Randy Meyer, Ohio EPA DSHWM, concerning the closure plan for Tank No. 100	September 8, 1988	UST
234*	Letter from B.G. Constantelos, U.S. EPA, to H. Rawski, Rockwell International, concerning the closure plan for Tank No. 100	November 25, 1988	UST
235*	Letter from Andrew Kubulac, Ohio EPA DSHWM, to Thomas Crepeau, Ohio EPA DSHWM, concerning inspection of Tank No. 100 closure activities	May 23, 1989	UST
236*	Letter from Thomas Crepeau, Ohio EPA, to Michael Zawyer, McDonnell-Douglass, stating that closure activities for Tank No. 100 are complete.	June 14, 1989	UST
237*	Letter from H. Rawski, Rockwell International, to Warren Tyler, Ohio EPA, asking for an extension for closure of Tank No. 108.	January 30, 1986	UST
238*	Letter from Thomas Crepeau, Ohio EPA, to Jerry Tucker, Rockwell International, stating that closure activities for Tank No. 108 are complete.	August 18, 1989	UST

Reference Number	Title	Date	Sort Code
239*	Letter from Andrew Kubulac, Ohio EPA DSHWM, to Thomas Crepeau, Ohio EPA DSHWM, concerning inspection of Tank No. 243 closure activities.	January 18.1989	UST
240*	Letter from H. Rawski, Rockwell International, to Thomas Crepeau, Ohio EPA, stating that Tank No. 243 has been closed and providing the consultant's closure certification.	November 14, 1988	UST
241*	Letter from Thomas Crepeau, Ohio EPA, to Lt. Col. Ruppert, U.S. Air Force, stating that closure activities for Tank No. 243 are complete.	February 14, 1989	UST
242*	Restoration of Abandoned Hazardous Waste Storage Sites, Site Plan (map), Floyd Browne Associates Limited.	February 1986	UST
269*	Site Assessment for Incident No. 2531387, UST 257, AFP 85, OHM.	September 3, 1997	UST
286*	Restoration of Abandoned Hazardous Waste Storage Tanks: individual reports of analytical results, OHM	1987-1988	UST
287*	Letter from John W. McClellan, U.S. Air Force, to Dave Rupert, Rockwell International, identifying soil cleanup goals at AFP 85 of 5ppm for TCE and 50 ppm for TCA	May 6, 1988	UST
288*	Rockwell/OHM Contract Change Agreement, Restore Abandoned Hazardous Waste Storage Sites, including a listing of work completed	May 5, 1988	UST
289*	New tank list for AFP 85, J. LeRose, Rockwell	January 5, 1988	UST
290*	Letter from H. Rawski, Rockwell, to HQ, Aeronautical Systems Division, regarding plans for closure of Tank 97	December 2, 1987	UST
291*	Letter from Jeffrey Stevens, OHM to Jeff LeRose, Rockwell, concerning characteristics and disposal of Tank 287 contents	August 23, 1988	UST
292*	Index to Tanks	No Date	UST
293*	Letter from Ronald B. Hale, U.S. Air Force, to N.H. Leatherman, Rockwell, confirming that the target cleanup level for oil and grease at AFP 85 is 500 ppm	December 18, 1987	UST
294*	Summary of laboratory analyses performed on samples from Restoration of Abandoned Hazardous Waste Storage Tanks project	No Date	UST
295*	Transmittal from Jeff Steven, OHM, to Jeff LeRose, Rockwell with CCN No. 5 Summary attached, identifying analyses conducted and actual amounts of soil removed the Restoration of Abandoned Hazardous Waste Storage Tanks project,	January 13, 1989	UST
296*	Letter from Jeff Steven, OHM, to Jeff LeRose, Rockwell, with CCA No. 4 Summary attached, identifying analyses conducted and actual amounts of soil removed the Restoration of Abandoned Hazardous Waste Storage Tanks project,	November 29, 1988	UST
297*	Field notes on tank excavations signed by Jeff LeRose, Rockwell, and Greg Cooper, OHM	1988, 1989	UST

Reference Number	Title	Date	Sort Code
298*	Letter from Henry Rawski, Rockwell, to Chuck Alfred, U.S. Air Force, requesting guidance on cleanup levels for UST removals	September 14, 1987	UST
299*	Miscellaneous waste profiles from the Restoration of Abandoned Hazardous Waste Storage Tanks project	1988, 1989	UST
300*	Letter from Jeff Stevens, OHM, to John Juniper, Rockwell, concerning tank removal delays	October 5, 1987	UST
301*	Miscellaneous hazardous waste manifests and certificates of disposal from the Restoration of Abandoned Hazardous Waste Storage Tanks project	1988	UST
302*	Letter from N.H. Leatherman, Rockwell, to P.J. Ruppert, U.S. Air Force, concerning cleanup levels for oil and grease at former UST sites.	December 8, 1987	UST
303*	Analytical results of groundwater and soil samples before tank removals for the Restoration of Abandoned Hazardous Waste Storage Tanks project, Floyd Browne Associates	1985	UST
304*	Borehole logs for the Restoration of Abandoned Hazardous Waste Storage Tanks project, Woodward-Clyde Consultants	1985	UST
305*	Meeting notes and attachments for the Restoration of Abandoned Hazardous Waste Storage Tanks project	October 10, 1985	UST
306*	Meeting notes for the Restoration of Abandoned Hazardous Waste Storage Tanks project	May 25, 1988	UST
307*	Specifications for the Restoration of Abandoned Hazardous Waste Storage Tanks project (installation of tanks 544-550)	February 26, 1986	UST
311*	Results of PCB analyses of contents of tank 287 and of surrounding soil. Associated correspondence and waste profiles attached.	May 21, 1987	UST
312*	Telephone log of conversation between Mike Zwayer, Rockwell, with Jay Roberts, Floyd Brown Associates, concerning analyses of UST contents and approximate UST installation dates.	April 2, 1986	UST
313*	Schedule of Existing Underground Tanks, including tank contents and dimensions, Floyd Browne Associates.	November 15, 1985	UST
315*	Ohio Underground Storage Tank Regulations, OAC Rule1301:7-9. Bureau of Underground Storage Tank Regulations, Division of State Fire Marshal, Ohio Department of Commerce.	February 1, 1997	UST
316*	Corrective Action Guidance Document, Bureau of Underground Storage Tank Regulations, Division of State Fire Marshal, Ohio Department of Commerce.	November, 1992	UST
317*	Closure Guidance Document, Bureau of Underground Storage Tank Regulations, Division of State Fire Marshal, Ohio Department of Commerce.	June 1995	UST

Reference Number	Title	Date	Sort Code
322*	Telecon between Earth Tech and Ray Ladrick, Ohio BUSTR, regarding regulations for investigating VAP ineligible former UST sites	June 17, 1998	UST
325*	Telephone conversation between Earth Tech and Ray Ladrick, Ohio BUSTR, regarding analytical methods required for stoddard solvent	July, 1998	UST
326*	Telephone conversation between Earth Tech and Ray Ladrick, Ohio BUSTR, regarding analytical methods to be used for solvents.	June 26, 1998	UST
	Wastewater		
17*	City of Columbus, Division of Sewerage and Drainage Waste Water Discharge Permit, Department of Public Utilities.	April 5, 1993	WW
141*	Water Reuse Study for Naval Weapons Industrial Reserve Plant, Alden E. Stilson & Associates.	May 1973	WW
144	WTP - Portions of Operating Manual.	No Date	WW
146	WTP - Quarterly Effluent Analysis Reports.	October 1992 through November 1993	WW

* = Document located in Earth Tech, Alexandria, Virginia office, AFP 85 files.

Sort Code Key:

A	=	Air	NOV	=	Notice of Violation
ADJ	=	Adjacent Property	PCB	=	Polychlorinated Biphenyl
AS	=	Asbestos	REF	=	Related Environmental Factors
AST	=	Aboveground Storage Tank	REL	=	Release
CD	=	Comprehensive Documents	RM	=	Radioactive Material
GEN	=	General Site Information	RP	=	Real Property
HM	=	Hazardous Material	STW	=	Stormwater
HW	=	Hazardous Waste	UST	=	Underground Storage Tank
IRP	=	Installation Restoration Program	WW	=	Wastewater